Automatic Sub-stations in Des Moines, Iowa

ELECTRIC RAILWAY JOURNAL

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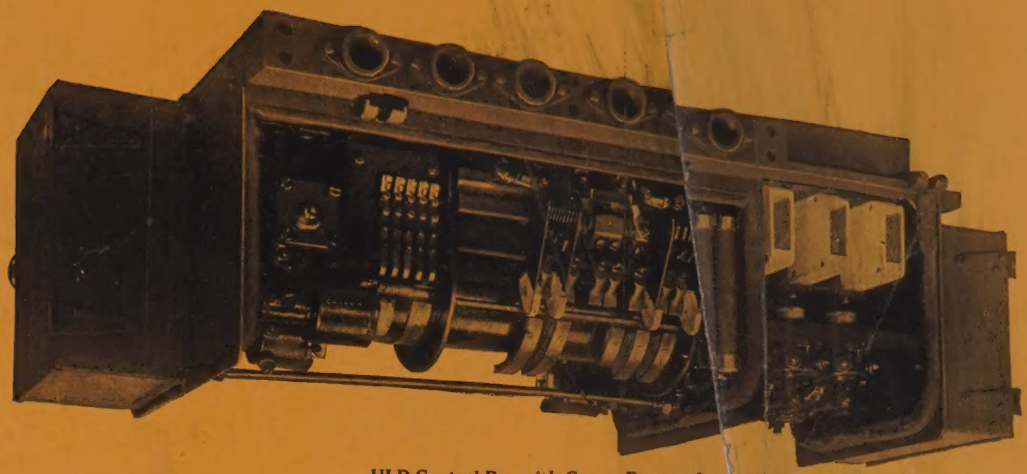

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AUTOMATIC SUBSTATIONS IN DES MOINES

We are pleased to be able to give our readers this week some data regarding the equipment of automatic substations now in process of installation in Des Moines, Iowa, on the city and interurban lines. The most striking fact in this case is that a large quantity of low-tension line copper is to be taken down and sold, a highly profitable undertaking with scrap copper at its present price. The significance of the Des Moines situation is that the engineers of the local railways had sufficient confidence in the reliability of this newcomer in the transportation field to proceed upon the basis of calculations to adopt it upon so large a scale. In this case, also, one element favoring the "automatic" was lacking, namely the possibility of making considerable immediate saving in labor cost. It had to justify its adoption upon the basis of low investment cost. Ultimately there will be a labor cost saving also but this will be "velvet" so to speak. In this installation the automatic principle will be applied in two ways. It will be used for the substations considered as units and also for the individual machines. In the first case the substations will come onto the line or go off as may be necessary to maintain proper voltage regulation, and in the second case where more than one rotary is installed the machine capacity will be adjusted to the load requirements so as to maintain high efficiency and prevent overloading. The flexibility of the automatics is indicated here as they are used in conjunction with the manually-operated substations, each type being assigned to the duty which it can best perform.

AUTOMATIC SUBSTATIONS IN GENERAL

It is but about a year and a quarter since we published the first account of an automatic substation equipment in the transportation field, that is on the Elgin & Belvidere Electric Railway, a small property in northeastern Illinois. This installation has since operated with entire satisfaction to the owners. Since then substantial progress has been made, and one manufacturer reports that at the end of 1916 there were twenty automatic electric railway substations under construction or in operation, the latter comprising about one-half of the total. This progress is quoted principally as evidence of the confidence felt in the reliability of the apparatus. The advantages of a scheme like this can be worked out nicely on paper, but after all they are only of academic interest if the element of reliability is lacking. The underlying principle involved here is that of utilizing the high-tension line to the fullest possible extent. With any system on which rotary converters are used it is obvious that the more uniformly these converters are spread over the system the less will be the amount of copper required in the low-tension distribution. However, with manually operated stations, the labor item soon sets a subdivision limit. With the automatics many more substations can be used, for the labor element is inconsiderable, but ultimately a limit is set by the increasingly higher cost per kilowatt of substation equipment, including buildings and sites, as the individual capacities of substations are lower. An economic balance must be struck to determine the proper number of units to be used in any case.

THE TRACTIVE RESISTANCE OF CARS ON CURVES

Last week we directed attention to the recently published description of tests, made under the auspices of the University of Illinois Engineering Experiment Station, on the tractive resistance of a double-truck electric car on curves. The results of the tests furnish data to show that there is a relation between speed and resistance, a fact which while suspected has in general been ignored for lack of definite information. Under these circumstances it has been customary to assume a value for the extra resistance due to track curvature on the basis of weight, degree of curvature and, sometimes, length of wheelbase. For rough calculations one extra pound per ton per degree curvature is a convenient factor, although this value is probably high for the usual conditions under which an electric car rounds curves. It appears from the University of Illinois tests, however, that unless the merest approximation to the force or the power required in rounding curves is desired such an assumption is entirely too crude. For example, from the sample chart printed last week the tractive resistance per ton at 35 m.p.h. on a 5-deg. curve is 10 lb., whereas at 1 lb. per degree curvature it would be 5 lb., or one-half as much. At 10 m.p.h. on an 8½-deg. curve the force is 5 lb., or, say, 30 per cent less than under the 1-lb.-per-ton-per-degree assumption. It may also be of interest to compare the power consumptions in the above cases. At 35 m.p.h. on the 5-deg. curve slightly over 0.9 hp. per ton is required to overcome curve resistance only, while at 10 m.p.h. on the 8½-deg. curve it is 0.133 hp. At 1-lb.-per-ton-per-degree the respective values would be 0.46 hp. and 0.226 hp. It must, of course, be remembered that the University of Illinois tests were made on one car and under somewhat limited track conditions. However, they furnish reference data of value. The components of curve resistance are of a nature to resist rational investigation. We must, therefore, largely depend upon empirical formulas like the one resulting from these tests.

A PRAISEWORTHY VALUATION REPORT

With the science of valuation still in a formative stage, as it is, we are glad to see any work that really tends to clarify the subject. We welcome, therefore, the long-awaited report of the valuation committee of the American Society of Civil Engineers, abstracted elsewhere this week, for it summarizes in a way that should be helpful to utilities the principles that should control the valuation of normal properties. Representing five years of steadfast work, in the course of which the first progress report was almost completely revamped, the present work ought to be of material service in reducing the uncertainties of valuation as now practiced, although in such a rapidly growing science it is necessarily not the last word.

What to our mind is the most admirable feature of the report is its comprehensiveness and fair discrimination. For instance, although it realizes the desirability of a goal of uniformity, it clearly sees that a sharp distinction must be made between what may be done under present laws and what may be done under future legislation and continuous commission control. New properties, old properties under regulation from their inception and old properties not subject to continuous regulation present different problems and demand different treatment along depreciation and other lines. In general, the report testifies to the painstaking efforts of the committee not to sacrifice justice to generalization, and it deserves careful study as an example of sanity in valuation literature.

The report is too voluminous to be discussed here in detail, but some of the noteworthy sections may be mentioned. The committee, for instance, recognizes that the bases for ratemaking, capitalization, taxation and public purchase are not necessarily the same, but that in each case "fair value" should be deduced by making full allowance for the tangible values in the property, however acquired, and also full allowance for intangibles as far as they are applicable to the purpose in mind. In other words, in an appraisal on the original cost or reproduction-cost basis there must first be included the tangible elements with assigned costs based on concrete facts, but the pertinent facts relating to intangible elements should then be developed independently, so that their value may be determined and added to the appraisal.

In regard to the two main indicators of tangible value, original cost and reproduction cost of existing property, it is evident that the committee is inclined to favor the latter, because of the practicable impossibility of obtaining a dependable result where the absence of reliable historical data makes necessary a resort to estimates of original cost, as in the case of old properties consisting mainly of long-lived items. We recognize, of course, the difficulty of obtaining an original cost figure when records are poor or unavailable, and to such an extent we agree with the committee. We believe, however, that original cost should be ascertained if possible as one of the elements of "fair value," and we are not at all certain that the resourceful engineer cannot, in the absence of only part of the original cost records, make suitable estimates with as great a degree of dependability as he can establish a proper reproduction cost schedule of the existing property for the application of present prices.

Other important points in the report have to do with land valuation, development expense and going value. Utilities that have seemed to try in various guises to secure what the Minnesota rate decision denied—an additional land value attaching to the property because of its higher use—will probably be disappointed in the finding of the committee on this point, but they should notice that the report is far from going to the extreme desired by some commissions, *i.e.*, striking off all elements except the naked formal value of land. In other words, the committee believes in the full allowance of all real items of cost, including the compulsory feature, severance damages and acquisition expenses. In regard to development expenses, the committee, in classifying these as an unavoidable real cost to be added to the cost of the physical property, has recognized the demand of commissions that such expenses be proved by the presentation of concrete facts, while in making going value a distinct and intangible element the committee has taken a step that should clarify the existing confusion and secure for this item its proper recognition with other elements that are included in the intangible group.

We have mentioned before the realization of the committee that different utilities must be treated differently in valuation matters. The report particularly emphasizes this in depreciation matters. Its analysis is very clear. What it happily calls "decretion" or loss of service life is always present in some degree even in a well-maintained property. Whether the cost of decretion, however, is a deductible quantity or "depreciation of valuation" simply depends on the accounting procedure that has been followed, or should have been followed under regulation. If the heretofore much-criticized replacement method is used, as on railways where renewals are handled as ordinary maintenance and retirements after a time proceed with fair regularity and cause no serious variations in the return, the cost of decretion found to exist at any time should not be deducted from the valuation because the public has not yet paid for the accrued decretion and is still under obligation to pay for it. Where a commission, however, has prescribed an accumulating depreciation fund in order to make provision in advance for the full decretion of property items, the cost of decretion should be deducted in securing the rate base, but this deduction should be offset by the fund found in public service, either as a separate fund or as additions to plant. Complications arise, for instance, when the accounting treatment of depreciation has not been uniform or when regulation has limited earnings so that they have not been sufficient to cover operating expenses, depreciation allowances and a fair return. In the former case the committee positively says that the depreciation of valuation should be equivalent merely to the accu-

mulated contributions of the public for depreciation allowances. In the latter case the committee qualifies its suggestion of the same procedure by saying that the relative importance of depreciation and a fair return is a matter of equity which will have to be decided by the court. This is undoubtedly correct, but when the courts act we hope that utility owners will not be penalized because of the failure of commissions to allow adequate earnings.

PURCHASE AND SALE OF ELECTRICAL ENERGY BY ELECTRIC RAILWAYS

There are few electric railways which are not interested in electrical energy as a commodity to be bought or sold, or both. In many localities energy can be purchased more cheaply than it can be generated, in others it is economical not only to generate electrical energy but to sell it also, at wholesale or retail. The businesses of transportation and electricity supply are constantly becoming more intimately related so that there are many properties which supply both kinds of service. In other cases, railway and lighting properties are united through holding companies. On the properties where all of the energy is consumed locally in transportation and other railway uses the motive power department virtually sells energy to the transportation department. It is highly important, therefore, for every railway management to know exactly what energy is worth locally, and what the profit is, either when buying or selling or producing for home consumption.

At a meeting of the American Institute of Electrical Engineers, held on April 26, L. B. Stillwell stated that in a 50,000-kw. steam plant with a load of 50 per cent load factor the total cost of energy varies from about 0.4 cent per kilowatt-hour with coal at $1 per ton to 0.75 cent with $5 coal. He assumed a unit power plant cost of $63.70 per kilowatt. The Cleveland controversy over the question of the purchase of additional power for the railway from the central station company or from the Municipal plant, which was just settled, has brought out some fundamental facts. The Engineering Association committee on power generation submitted some valuable tables at the Atlantic City convention giving detailed costs for a number of typical plants. Unfortunately these data were printed for private circulation only, but they are available to members of the association. They show annual average operating costs between about 0.3 cent and 0.6 cent per kilowatt-hr. with load factors from 33 per cent to 44 per cent and outputs between 40,000,000 and 130,000,000 kw.-hr. per year.

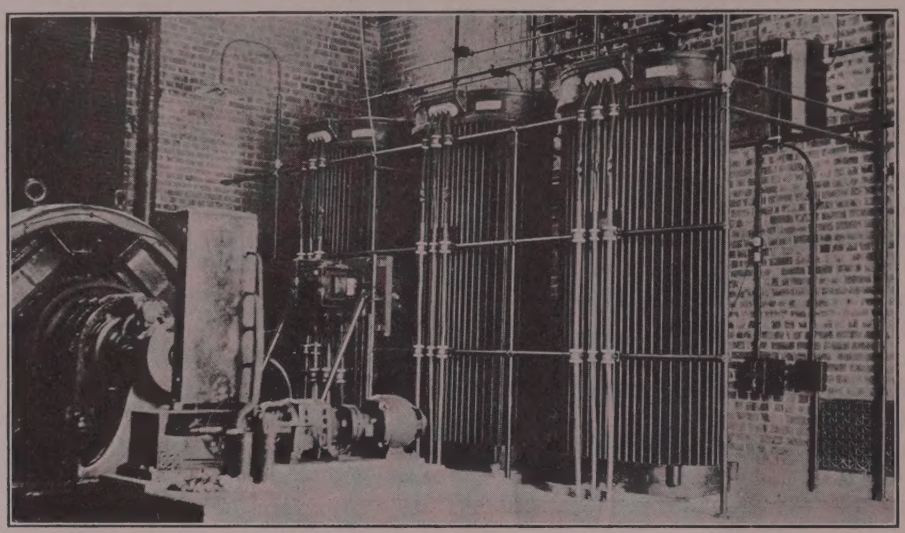
So great is the interest in the subject of energy purchase and sale by railways and so active are the central station companies in going after central station load that the ELECTRIC RAILWAY JOURNAL has found it desirable to investigate the present status of this business with the aid of the *McGraw Electric Railway Directory*. On account of the complicated organization of many companies the results can be stated only approximately, but they will serve as a general guide and as supplementary to the data given in the latest report of the Bureau of the Census. It appears that about 18 per cent of the electric railway companies in this country are doing a supplementary power business and 24 per cent a lighting business. Of the total number 55 per cent generate their own power and 45 per cent purchase power, these classes overlapping to the extent of about 2 per cent. The railways generating power operate roughly 70 per cent of the mileage and 74 per cent of the rolling stock, indicating that in spite of the tendency toward purchasing, to which reference has been made in these columns from time to time and to which the latest census report directs special attention, the railways are still far from going out of the power business. Indeed, many of them are making a good profit by adding to their commercial load.

Whether purchase or sale of power is profitable or not depends so much upon local conditions that no general rule is applicable. The whole matter was summarized in H. G. Stott's New Haven paper, abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for June 24, 1916, page 1170. He pointed out that it comes down ultimately to the question of load factor. That is, the plant which has the most nearly uniform load can, everything else being equal, produce energy most cheaply. It is of minor importance who owns and operates the plant. There is, of course, the related question of reliability, for no railway can afford to risk preventable interruption of power supply. This risk, however, is not as great as it was a few years ago for the perfecting of protective devices has rendered electrical energy supply remarkably continuous.

The most difficult feature of this whole subject is the calculation of the exact cost of electrical energy. The fuel, water, labor and other operating components of cost can be obtained from the records, but the overhead charges must be estimated and thus uncertain elements are brought in. It is customary to assume certain interest and depreciation rates which must porvide for keeping the plant in an assumed "per cent condition." But no prophet can tell what a year will bring forth in the way of technical progress, necessitating the retirement from service of generating units mechanically perfect. Take for example the virtual crowding out of the reciprocating engine by the steam turbine, and in turn that of the vertical turbine by the horizontal. Such a process is expensive but is incident to progress. It is a factor in the cost of power. Fortunately, the unit cost of power plant, *i.e.*, the investment cost per kilowatt, is decreasing. This fact combined with an accompanying load factor improvement accounts for a greatly increased annual output per dollar invested. Investment in plant and depreciation thereof are, therefore, less important than formerly. It should thus be easier as time goes on to calculate the cost of power. The technical association committees which are working along this line should, however, be given every possible facility for their work.

Automatic Substations Permit Large Saving in Des Moines

First Cost of Seven City Substations Under Construction Is $140,000 Less Than the Cost of Manually-Operated Converters and Feeder System for Equal Losses—Present Plan Calls for Ten Automatic Substations, City and Interurban—$90,000 Worth of Copper in Old Feeder System Is to Be Taken Down and Sold



BANK OF TRANSFORMERS, TWELFTH AND HIGH STREETS, AUTOMATIC SUBSTATION, DES MOINES, IOWA

THE first example of the application of the automatic substation to an entire city property is the installation now being made in Des Moines, Iowa. Four automatic substations including one portable substation are now in operation and seven more are under construction or on order.

The principle of the automatic substation is already familiar to the readers of the ELECTRIC RAILWAY JOURNAL through several articles which have been published. It is that variation in line voltage is utilized to control the starting and stopping of rotary converters, and the switching operations. The details of operation of an early installation were presented in the issue of ELECTRIC RAILWAY JOURNAL for Sept. 18, 1915, page 583, where the equipment of the Elgin & Belvidere Electric Railway was described. The equipment as installed at Des Moines is in all essentials identical with that in the earlier installation, except for some refinements in the control apparatus.

TWO PLANS FOR INCREASING LINE CAPACITY

The plan in general includes the complete operation of the lines of the Des Moines City Railway from automatic substations and the supply of power to the Inter-Urban Railway, which is under the same management, at points intermediate to the present substations in order to provide for the very heavy freight traffic and to eliminate the excessive voltage drop. For the present there will be seven automatic rotary converters on the city lines and three on the interurban lines located as shown on the accompanying maps. Plans not yet complete involve two additional machines on the city lines and several more on the interurban lines.

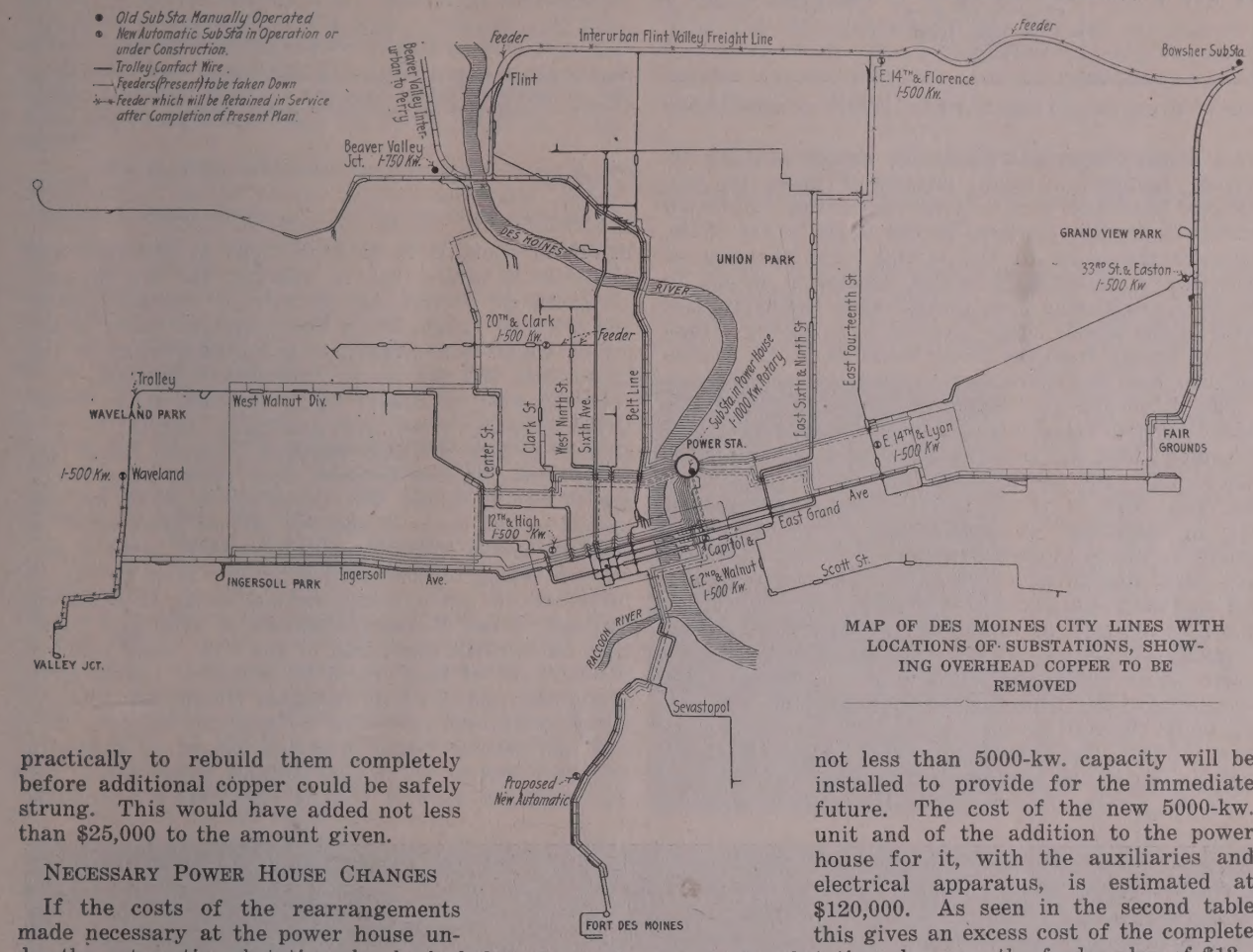
The introduction of the automatic substation in electric railway work came at a time fortunate for the Des Moines properties. The company had been fighting for fifteen years to gain a franchise, in the meantime being hampered in financing new work needed to keep the property up to the greatly increasing transportation needs of the city and surrounding territory. The power loss due to insufficiency of copper in the lines was excessive, so great in certain localities that it was at times barely possible to move the cars. Then upon the granting of a franchise last year forty new four-motor cars were purchased and placed in service, rendering imperative the bettering of the conditions in the direct-current feeder system.

With money available, the first impulse, of course, was to put up more copper. It was estimated, however, that the cost of putting the city feeder system into such a condition that the losses would approximate 10 per cent, would be about $345,000. This estimate was made after an exhaustive study of the conditions, involving the making of many thousand voltage readings at numerous points on the city lines. It included the cost of installing two additional 1000-kw. rotary converters at the power house.

A study of the possibilities of the automatic substation was then made, and it was found that for the city alone an adequate distribution system giving voltage regulation equal to or better than would have been obtained under the previous plan could be installed for $51,500 less first cost. To this could be added the sum of $90,000, the value of the copper which was no longer necessary and could be taken down and sold. The detailed estimates are given in Table I.

Under the latter plan it was, of course, necessary to erect transmission lines to the several new substations,

at a cost estimated at $2000 a mile. The first cost was materially lessened by installing auto-transformers and equipment for doubling the power plant generating voltage to transmit at 4400 volts instead of 2200 volts. The total cost of $345,000 under the first plan is in reality not a fair figure with which to compare the cost of the automatic-substation plan for the condition of the feeder lines is such that it would have been necessary practically to rebuild them completely before additional copper could be safely strung. This would have added not less than $25,000 to the amount given.



MAP OF DES MOINES CITY LINES WITH LOCATIONS OF SUBSTATIONS, SHOWING OVERHEAD COPPER TO BE REMOVED

NECESSARY POWER HOUSE CHANGES

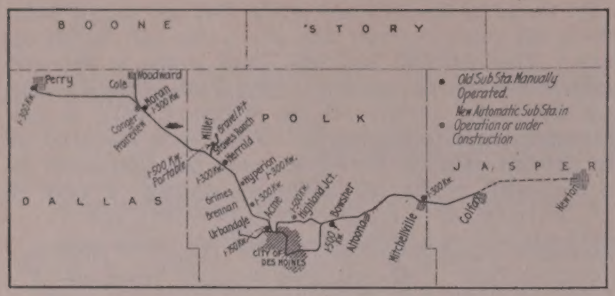
If the costs of the rearrangements made necessary at the power house under the automatic substation plan be included, the total cost is apparently slightly greater than the feeder plan, but this is not really the case, for the following reason: The power house is now equipped with one 2000-kw. and one 1000-kw. turbine units, and two 1000-kw. direct-current reciprocating cross-compound units. With the feeder system taken down, these two direct-current units would be useless, and while they are worth $40,000 in the present plant, they are worth only $5,000 as junk. This $40,000 less the junk value is charged against the substation plan. But before these units and the feeder system can be dispensed with, a new turbo-generator is necessary. While it is essential at the present moment to replace only the equipment to be discarded, which has 2000-kw. capacity, a unit of not less than 5000-kw. capacity will be installed to provide for the immediate future. The cost of the new 5000-kw. unit and of the addition to the power house for it, with the auxiliaries and electrical apparatus, is estimated at $120,000. As seen in the second table this gives an excess cost of the complete automatic substation plan over the feeder plan of $13,300, but increases the station capacity by 3000 kw. and frees the station space previously occupied by the reciprocating units. No provision is made for future growth in the $345,000 feeder plan. Such provision is necessary, as the load is now up to the capacity of the present plant. Estimating at $13,300 the cost of the 3000 kw. of additional capacity, it is secured at a rate of $4.43 per kilowatt. If in the feeder plan $120,000 is added for the cost of a 5000-kw. unit and $25,000 for rebuilding the feeder pole lines, to put the two plans upon a more nearly comparable cost basis, the automatic equipment is seen to be more economical. The complete comparison is given in Table II on page 68.

TABLE I—DETAILED ESTIMATE OF COST OF INSTALLING ADEQUAE DISTRIBUTION SYSTEM

Feeder Plan	
Present feeder copper, at 25 cents per pound	$112,800
Additional copper necessary for proper voltage regulation, at 25 cents	172,500
Two 1000-kw. rotary converters installed in power house, building extension, switchboard, equipment, etc.	60,000
	$345,300
Automatic Substation Plan	
Present feeder copper	$112,800
Seven rotary converters and control equipment	98,000
Installation of seven equipments	8,500
Seven substation buildings	21,000
Seventeen miles 4400-volt transmission line	34,000
Miscellaneous material	10,000
Auto transformers for stepping voltage from 2200 to 4400, labor, cable, switching equipment, etc.	9,500
	$293,800
Credit feeder copper taken down at 20 cents	90,200
	$203,600
Manually-operated-substations plan, total	$345,300
Automatically-operated-substations plan, total	203,600
Difference	$141,700

PRACTICAL WORKING OUT OF THE PLAN INVOLVING AUTOMATIC SUBSTATIONS

One of the principal features of the automatic substation is the economic possibility of placing stations where the power is needed. In Des Moines practically all cars pass through the downtown "loop" district, indicated on the accompanying map within the light dot-dash line, and the power requirements in this area are consequently very great. In the new plan a substation is placed at either end of the loop. The line losses are cut down so materially thereby that the trolley wire pro-



MAP OF INTERURBAN LINES WITH LOCATIONS OF SUBSTATIONS

vides ample copper and all feeder copper is to be removed. Comparison of the location of these two substations with the former location of the substation nearest to the loop district, the one in the power house, indicates the cause of the saving. Yet the cost of operating a manually-controlled substation placed in the loop would have been greater than the capitalized value of the copper losses involved in supplying direct-current energy from the power house where the station engineer does the operating.

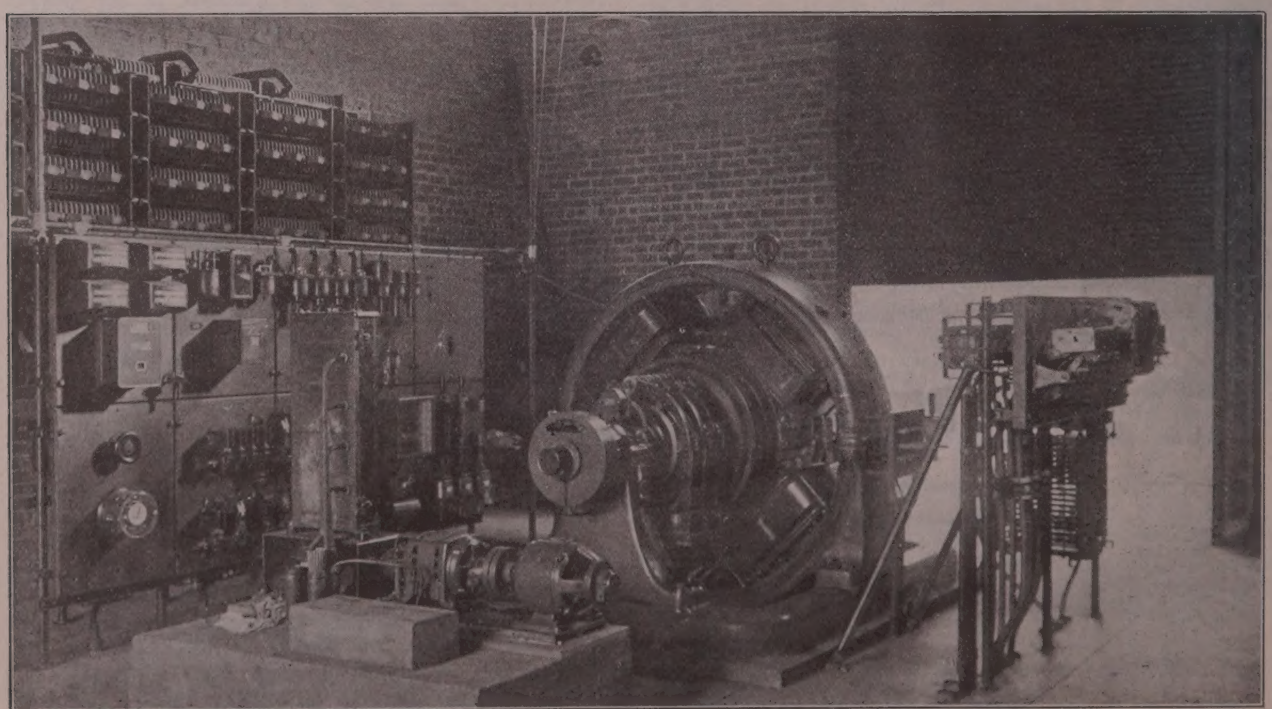
The substation at Twelfth and High Streets is designed for two rotaries which will be arranged so that the second unit will come in on the line only after the load at that point has increased beyond the capacity of the first. One of these units, a 500-kw. machine, is now in operation. A single 500-kw. unit will very shortly be placed in operation at the opposite end of the loop, East Second and Walnut Streets, and the other five automatic stations will be located over the city, as shown in the map, as rapidly as the work can be done. Formerly the entire city lines were supplied from the power house substation, from a few feeders carried back into the city from the Beaver Valley Junction substation on the west division of the interurban, 4.5 miles from the loop, and from the Bowsher substation on the east division of the interurban, 7.4 miles from the loop.

On the Colfax division of the Inter-Urban property power is supplied from substations at Bowsher and Mitchellville, which will be retained for the present. An extension of this line to Newton is contemplated, and with its completion a heavy freight traffic is expected which will necessitate a rearrangement of the substations and the use of automatic equipment.

TABLE II—COMPARATIVE COST INCLUDING THE GENERATING STATION CHANGES

Loss due to elimination of two 1000-kw. direct-current reciprocating units	$40,000
Cost of new 5000-kw. turbo-generator installed, extension of station, switchboard equipment, condenser, etc.	120,000
	$160,000
Credit for junk value of two 1000-kw. direct-current units	5,000
	$155,000
Saving with automatic rather than manual plan, outside of station	141,700
Additional cost with gain of 3000 kw. in capacity	$13,300
Cost per kilowatt of 3000 kw. additional station capacity	$4.43
Cost of feeder plan from previous table, about	$345,000
Cost of rebuilding feeder pole lines	25,000
Cost of adding 5000 kw. turbine to power house	120,000
	$490,000
Cost of complete automatic substation plan ($203,600 plus $155,000)	358,600
Overall first-cost saving in favor of automatic station	$131,400

On the west, or Beaver Valley division, of the Inter-Urban property, power was previously supplied by substations at Beaver Valley Junction, Herrold, Moran and Perry, the distances between them being, respectively, 8.7, 11 and 11 miles. Some time ago a gravel pit was opened on the banks of the Des Moines River north of Herrold, and a 2.25-mile spur was built to it to permit the taking of contract for hauling from twenty to forty cars of gravel a day and delivering them to the Chicago, Great Western Railroad at Highland Junction, on the belt line north of the city. Last summer the haul-out of this gravel pit averaged nearly forty cars a day, and this with the other freight haul and the heavy grades and curves on the spur and between Herrold and Beaver Valley Junction caused an excessive drop in voltage. To provide suitable power supply for this profitable carload freight two 300-kw. automatic



CONTROL BOARD, LIMITING RESISTORS, MOTOR-GENERATOR POLARITY REGULATOR, ROTARY CONVERTER AND MACHINE SWITCHES IN TWELFTH AND HIGH STREETS SUBSTATION

substations were installed at Brennan and Hyperion, in the 8.7-mile space between Beaver Valley Junction and Herrold substations. The spacing on the section of line between substations was thus made 3.7 miles from Beaver Valley Junction to Brennan; 2.7 miles from Brennan to Hyperion, and 2.3 miles from Hyperion to Herrold. A 500-kw. portable automatic substation was used all during the summer while the gravel pit was in operation at a mid-point on the 2¼-mile spur, as indicated on the map. This portable substation is completely equipped to be used on either the 23,000-volt line supplying the interurban substations or the 4400-volt lines in the city, it being possible to make the change-over from one to the other in a few hours.

In addition to these three substations on the route of the principal freight traffic, another automatic station is being installed midway between the two interurban divisions on the 6-mile connecting belt line north of the city. This will be equipped with one 500-kw. unit and will greatly improve the operating conditions over this belt line, which has a profile with rather stiff grades for heavy traffic both ways. While the capacity represented by these six substations between the gravel pit and the interchange with the Great Western is more than enough for present requirements, it has been planned for the growth expected in the immediate future. It is expected that the output of the gravel pit will be doubled next summer, and this alone will make considerable traffic over these lines.

At Perry, Moran, Herrold, Bowsher and Mitchellville the day operator also acts as station, ticket and freight agent, handles train orders, etc., and as these other duties require the services of a man anyway, the stations will be continued under manual operation for the present. As the business grows, however, and the combined duties become greater than one man can handle, automatic control equipment will be installed. The situation at Perry has very nearly reached the point where it will be necessary to put on a second day operator, and this station will probably be equipped with automatic control at an early date.

Work is being pushed on the construction of the power house extension and the installation of the new 5000-kw. turbine-generator unit in order to make it possible to take down the present feeder system while the copper market is favorable. The work planned at the power house also includes extensive rearrangements designed to bring the whole station up to a thoroughly modern plant. Good operating economy has been gained in the old plant by utilizing the exhaust from the two cross-compound reciprocating units in a mixed-pressure turbine and balancing the load between the alternating-current and direct-current generators by floating a 1000-kw. rotary converter between the two.

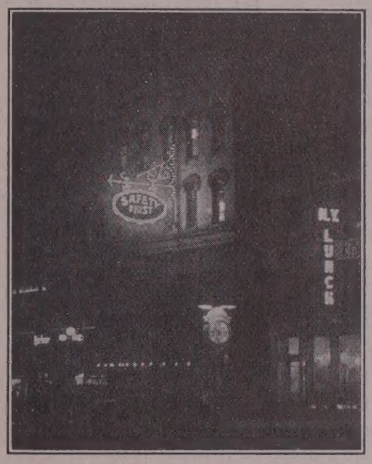
ECONOMIES TO BE REALIZED

The figures given in the early paragraphs of this article do not take into consideration the operating savings resulting from the automatic apparatus. Just what these will amount to is difficult to estimate, but it is certain that the saving resulting from the elimination of light-load losses will be very important. At present no station operators are displaced because of the previous location of the city substation at the power house, where the same number of men must be employed anyway, and on interurban lines because of other duties assigned to the operators. But the absence of the labor cost is distinctly the feature which makes it economically possible to place the automatic stations at the places needed to gain this great saving in copper and the much better voltage conditions than possible by any other plan. The gross savings to be realized must remain largely a matter of conjecture until a period of operation brings out the finite results. When the installation is completed, it is expected that one inspector for the interurban substations and one for the city substations will be all the labor necessary to the operation of all the direct-current supply stations, which will probably eventually number upwards of sixteen stations.

The Des Moines installation was laid out and engineered by F. C. Chambers, mechanical and electrical engineer for the company, and the operation of the substations is directly in charge of C. A. Butcher.

Columbus Railway Impresses Safety-First Move by Night as Well as by Day

A large electric sign mounted on the front of the office building of the Columbus Railway, Power & Light Company blazes forth the warning and the company's interest in the safety-first movement, both night and day. As it is the only illuminated sign on the company's office building, it naturally emphasizes the company's position in safety work. It is very plainly distinguishable from the viaduct on High Street in front of the Union Station, which is at a higher elevation than the downtown section of the street, and is, therefore, one of the first things noticed by the traveler as he leaves the station and looks up the main street. In this manner it has attracted a great deal of attention on the part of the strangers in the city as well as the residents.



ELECTRIC SAFETY-FIRST SIGN ON THE FRONT OF COLUMBUS (OHIO) RAILWAY OFFICE BUILDING

This sign is simply one of the means which the Columbus company has taken to carry on its active work in the interest of safety, and in which it has been unusually successful. The significant features of this work were brought out in a paper read by Harold W. Clapp, general superintendent, before the Central Electric Railway Association recently and published on page 1110 of the Nov. 25, 1916, ELECTRIC RAILWAY JOURNAL.

Consolidation of French Technical Journals

The most important two journals in the electrical field in France, *La Lumière Electrique* and *La Revue Electrique*, have united to form the new *Revue Generale de l'Electricité*. This will be a weekly of about fifty pages each issue, and it will be the official organ of the Union des Syndicats de l'Electricité. The publication will contain four general sections, namely, scientific and technical; industrial; economic and financial, and legislative. The office of publication is 12, Place de Laborde, Paris, and the subscription price in France is 40 francs and in foreign countries 50 francs per annum.

Unit Costs of Construction for Permanent Way

Data Transmitted to Massachusetts Public Service Commission by H. W. Hayes, Engineer of the Commission, Were Gathered from Numerous Sources

IN connection with a report to the Massachusetts Public Service Commission by the engineering department of the board for the purpose of comparing construction cost data submitted by the Bay State Street Railway with similar data from other sources, a large amount of material has been assembled which is of interest to estimators. Selections from these data covering permanent way matters are printed below, only such items being listed as appear useful in general practice. In his letter of transmittal to the board, H. W. Hayes, engineer of the commission, states that the cost data presented were obtained from many sources, notably from the purchase records of the Boston Elevated Railway, the Middlesex & Boston Street Railway, Worcester Consolidated Street Railway and other operating properties; from the Massachusetts Highway Commission, Boston Transit Commission, and from dealers and manufacturers. In the following notes, the source of each unit cost figure is given, so far as possible, and so far as feasible, only recent data are included unless otherwise specified.

The Interstate Commerce Commission's classification has been followed in the items listed.

SPECIAL WORK

I. C. C. ACCT. No. 508

All costs except final distribution of crossings, crossovers, curves, frogs, switches, mates and portions of track made to order.

Public Service Commission engineering department estimate of average costs of special work (material only) f.o.b. destination in Massachusetts.

Allow 12 ft. of track for switch and mate: 6 ft. for frog.

1915 Costs, 9-In. Girder Rail	Solid Insert	Heavy Insert	Light Insert
Switch, each	$240.00	$190.00	.....
Mate, each	160.00	130.00	$117.00
Frog, each	160.00	120.00	108.00
Curved track, per foot	3.80	3.80	3.30
Straight track, per foot	3.20	3.20	2.70

For 7-in. or 6-in. girder, deduct 10 per cent from above prices.

Allow 12 ft. of track for switch and mate: 6 ft. for frog.

1915 Costs T-rail work not more than 4.25 in. high.	Heavy Insert	Light Insert
Switch, each	Add 10 per cen	$125.00
Mate, each	to 15 per cent	80.00
Frog, each	.....	70.00
Curved track, per foot	.....	2.50
Straight track, per foot	.....	2.00
Z guard, 4.25-in. T-rail		$0.80 per foot
Bar guard, 4.25-in. T-rail		.50 per foot
Split switch turnout ends, 15-ft. points, all accessories and ground throw, single or double spring frogs, average		120.00 per end
Add for frog guards		7.50 each

RAIL

I. C. C. ACCT. No. 507

Average prices paid by Boston Elevated Railway f.o.b. destination per gross ton, drilling included.

	Girder Less Than 100 Lb.	Girder Over 100 Lb.	Guard Over 100 Lb.	T Less Than 6 In.	T 6 In. or Over	Tram	Stringer Guard
1910	$39.88	$35.70	.....	$33.44	$36.00	.....	$45.00
1911	37.91	40.42	$54.96	31.51	36.00	.....	.....
1912	38.62	39.20	54.93	.....	39.09	.....	.....
1913	39.20	39.09	55.88	35.09	.....	.....	.....
1914	39.26	39.06	56.05	32.40	.....	$48.16	.....
1915	.....	41.27	56.35	.....	39.68	.....	.....

Mill inspection, 1902-1914, $0.05 per ton.

Bay State Street Railway, record of purchases f.o.b. destination, 1906-1913, 12,991 tons (T) at $30.38.

Adding 35 cents for inspection and warehousing, $30.73.

SPIKES

I. C. C. ACCT. No. 507

Price per keg of 200 lb.

	Kegs	Per Keg
Bay State Street Railway average to 11-14	.....	$4.10
Middlesex & Boston, 1899-1914	1,329	4.28
Boston Elevated Railway, 1895-1914	24,611	3.90
Worcester Consolidated, 1902-1915	4,295	3.85
Total and average price	30,295	3.91
Add for warehousing 5 per cent	.....	.19
Total average price per keg	.....	$4.10

GIRDER RAILS

I. C. C. ACCT. No. 507

Middlesex & Boston, 1902-1914, 1,583 tons at	$39.09
Boston Elevated Railway, 1902-1914, 22,525 tons at	38.85
Worcester Consolidated and Springfield, 1902-1914, 5,805 tons at	38.82
Average of above, including 35 cents for inspection and warehousing	39.21 per ton

FLAT TIE RODS

I. C. C. ACCT. No. 507

Middlesex & Boston, 1902-1914	12,600	at $0.44 each
Worcester Consolidated, 1902-1915	18,063	.37
Boston Elevated Railway, 1894-1914	473,218	.37
Total and average price	503,881	$0.37
Add 5 per cent for warehousing		.02
Total		$0.39

Size and average price range Boston Elevated flat tie rods, 1894-1914:

2¼ in. x ⅞ in.	$0.04
1½ in. x ⅞ in. x 5 ft. 4 in.	.22
2¼ in. x ⅞ in. x 5 ft. 1¼ in.	.34
2¼ in. x ⅞ in. x 5 ft. 3⅛ in.	.345

ROUND TIE RODS

I. C. C. ACCT. No. 507

Boston Elevated Railway 1894-1914, ⅝ in. x 5 ft. 4½ in.	$0.13
Boston Elevated Railway, 1894-1914, 1 in.	0.30

TIE PLATES

I. C. C. ACCT. No. 507

Goldie, 175,120 (Boston Elevated), 1894-1914	$0.11 each

RAIL BRACES

I. C. C. ACCT. No. 507

60 lb. and 70 lb. Acme, Bay State records 1911, 500 at	$0.14 each
75 lb. Acme, Bay State records, 1911 at	0.165
45-lb. Niagara, Bay State to November, 1914 at	0.10
75-lb. Lebanon, Bay State to November, 1914 at	0.35

CHANNEL JOINTS ON GIRDER RAIL

I. C. C. ACCT. No. 507

Feustel—Bay State Street Railway average to November, 1914, including $0.0002 per pound for warehousing and inspection.

	For Sections	Weight		Per Joint
Tram P. S.	No. 200-9-in.	90	22-in. channel; including bolts	$1.57
Tram P. S.	No. 201-9-in.	85	24-in. channel; including bolts	1.68
Girder P. S.	No. 203-9-in.	113	26-in. channel; including bolts	1.80
Girder P. S.	No. 219-9-in.	85	32-in. channel; including bolts	2.29
Guard P. S.	No. 230-9-in.	100	36-in. channel; including bolts	2.53
Guard P. S.	No. 240-9-in.	87	36-in. channel (⅝ in.); including bolts	2.76
Guard girder P. S.	No. 222-8⅝-in.	95	22-in. channel; including bolts	1.56
Tram P. S.	No. 223-8⅝-in.	96	24-in. channel; including bolts	1.67
Guard girder P. S.	No. 226-8⅝-in.	94	26 in. channel; including bolts	1.79
Guard girder P. S.	No. 229-8⅝-in.	84	32-in. channel; including bolts	2.29
Tram P. S.	No. 93-8½-in.	90	36-in. channel; including bolts	2.66
Tram L. S.	No. 206-8⅜-in.	96	24-in. channel; including bolts	3.94
Tram L. S.	No. 288-8⅜-in.	89	26-in. channel; including bolts	4.18
Tram L. S.	No. 297-8⅜-in.	95	32-in. channel; including bolts	4.80
Guard girder L. S.	No. 319-8⅜-in.	95	36-in. channel; including bolts	5.3[illegible]
Girder P. S.	No. 273-9-in.	125	22-in. channel; including bolts	2.06
Girder P. S.	No. 273A-9-in.	133	32-in. channel; including bolts	3.02
Girder B. E.	No. 6-9-in.	132	36-in. channel; including bolts	3.30
Tram P. S.	No. 400-9-in	104	32-in. channel (1½ in.); including bolts, 1912	3.01
Girder P. S.	No. 401-9-in.	104	36-in. channel (1½ in.); including bolts, 1912	3.29
Girder L. S	No. 463-9-in.	104	32-in. channel (¾ in.); including bolts, 1913-14	3.05
Girder L. S.	No. 336-9-in.	94	36-in. channel (¾ in.); including bolts, 1913-14	3.35

Boston Elevated average cost of thirteen purchases of channel joints, adding $0.0002 for warehousing and inspection	$0.0202
Worcester Consolidated for eight ⅞-in. rail, 26-in. channel, including bolts	1.93
Worcester Consolidated for eight ⅞-in. rail, 32-in. channel, including bolts	2.38
Barbour-Stockwell Company 119 lb. 32-in. channel, including bolts, average	3.75
Barbour-Stockwell Company 134 lb. 36-in. channel, including bolts, average	4.15

BOLTED STEP OR COMPROMISE JOINTS

I. C. C. ACCT. No. 507

Feustel—Bay State average 1912-1914 including $0.0002 for warehousing and inspection.

	Each
T-rail to T-rail	$3.10
T-rail to girder rail	6.50
Girder rail to girder rail	5.50
Average of five Massachusetts street railways:	
T-rail to T-rail (range $2.83-$4.06)	3.27
T-rail to girder rail (range $4.43-$6.78)	6.04
Four railways—Girder rail to girder rail (range $3.86-$6.40)	5.09

FISH PLATES

I. C. C. ACCT. No. 507

Feustel—Bay State Street Railway average prices 1912-1914, including $0.0002.

	Per Joint
For 35 lb. T-rail, 24-in. fish plate, with bolts	$0.25
For 40 lb. T-rail, 24-in. fish plate, with bolts	0.29

BONZANO JOINTS

I. C. C. ACCT. No. 507

Feustel—Bay State Street Railway average price 1912-1914, including $0.0002 for warehousing and inspection.

For 60-lb. T-rail, 24-in. Bonzano with bolts	$0 90
For 67-lb. T-rail, 24-in. Bonzano with bolts	1.02
For 70-lb. T-rail, 24-in. Bonzano with bolts	1.11
For 75-lb. T-rail, 24-in. Bonzano with bolts	1.27
Boston Elevated Railway, 24-in. for 70-lb. T-rail, 1912	1.50

WELDED JOINTS ON GIRDER RAIL

I. C. C ACCT. No. 507

Feustel—Bay State Street Railway average prices to November, 1914, including $0.0002 for warehousing and inspection.

Lorain joints	$5.45
Lorain joints, head-supported	6.45
Thermit	12.00

ANGLE-BAR JOINTS

I. C. C. ACCT. No. 507

	Per Lb.
Boston Elevated Railway, weighted average, 5600 joints, without inspection	$0.0194
Boston Elevated Railway, weighted average, 1459 joints, average for T-rail over 60 lb.	0.0215
	Per Joint
Boston Elevated Railway, 24-in. for 45-lb. T-rail	$0.31-$0.48
Worcester Consolidated 24-in. for 70-lb. T-rail, 1915	0.77

CONTINUOUS JOINTS

I. C. C. ACCT. No. 507

	Per Joint
Bay State purchases 32-in. contin. girder rail, 1912	$4.75
Bay State purchases 36-in. contin. girder rail, 1913	5.60
Boston Elevated purchases 24-in. contin. for 58-60-lb. T-rail, 1901	1.17
Middlesex & Boston purchases 24-in. contin. for 58-60-lb. T-rail, 1915	1.40
Middlesex & Boston purchases 24 in. contin. for 70-lb. T-rail, 1915	1.52

WEBER JOINTS

I. C. C. Acct. No. 507

Feustel—Bay State Street Railway average to November, 1914, including $0.0002 per pound for warehousing and inspection.

For sections No. 222, etc., 26-in. Weber complete	$3.94
60-lb. T-rail, 24-in. Weber complete	1.55
70-lb. T-rail, 24 in. Weber complete	1.65
75-lb. T-rail, 24-in. Weber complete	1.83

GRADING

I. C. C. Acct. No. 504

Feustel—Bay State Street Railway to November, 1914.

	Per Cubic Yard	
Track trench in city	$0.60	
City line eastern Massachusetts, 11,530 ft. track, by company	.616	
Earth excavation country lines—Feustel-Bay State Street Railway to November, 1914	0.38	
Fifteen Massachusetts railroads, 1907-1914, earth excavation, country	0.423	
Rock excavation Feustel-Bay State Street Railway to November, 1914	1.82	
Rock excavation four Massachusetts railroads, 1907-1914	1.50	
Loose rock excavation, Feustel-Bay State Street Railway	1.00	
Rip Rap—rough, Feustel-Bay State Street Railway	2 00	
Rip Rap carefully placed, Feustel-Bay State Street Railway	1.50	
Dry rubble for retaining walls, Feustel-Bay State Street Railway	5.00	
Rubble masonry for retaining walls, Feustel-Bay State Street Railway	6.50	
Track and side catch basins, 14 in. x 14 in. cover and frame, Feustel B. S.	7.00	each
Track and side catch basins, 15 in. circular cover and frame, Feustel B. S.	7.00	each
Track and side catch basins, 20-in. circular cover and frame, Feustel B. S.	8.00	each
Track and side catch basins, 24-in. x 24-in. cover and frame Feustel B. S.	12.00	each
Track and side catch basins 30 in. x 30-in. cover and frame Feustel B. S.	16.00	each

GRAVEL

C. C. Acct. No. 55d

	Per Cubic Y5
Feustel-Bay State Street Railway to November 1914	$0.60
Boston Elevated 1913-1915, on wharf from sea bed	.50
Worcester Consolidated, 1907-1914, estimated haul 5 miles; including pitcost $0.05	.54
Crushed rock, Boston Elevated, 1915, 16,039 ft. of track	1.40
Crushed rock, Massachusetts Highway Commission, local stone, 292 contracts	1.44
Crushed rock, Massachusetts Highway Commission, trap rock, 447 contracts	2.06

TIES

I. C. C. Acct. No. 506

	Each
Chestnut 6 in. x 8 in. x 8 ft. Bay State, 1910-1914	$0.62
Chestnut, 6 in. x 8 in. x 8 ft. Springfield Street Railway, 1910-1914, 206,351 ties	0.469
Chestnut, 6 in. x 8 in. x 8 ft. Worcester Consolidated, 1910-1914, 397,565 ties	0.465
Chestnut, 6 in. x 8 in. x 7 ft. Boston Elevated, 1909-1913, 127,723 ties	0.612
Treated ties delivered to storage yard:	
Boston Elevated, 6 in. x 8 in. x 8 ft. hard pine, creosoted, sawed, 1915	$0.99

Fares in Annexed Districts

United States Supreme Court Decides It Has Jurisdiction in Detroit Case and That Annexation of Suburban Districts by Municipality Does Not Extend City Fare to Those Districts

A SHORT reference to the decision of the United States Supreme Court, delivered Dec. 11, 1916, in the case of the Detroit United Railway, plaintiff in error against the people of the State of Michigan and also against the city of Detroit, carried up from the Supreme Court of the State of Michigan, was mentioned in the issue of this paper for Dec. 16, page 1271. The full text of the decision, which was delivered by Justice Pitney, is now available. It is upon a matter which is of considerable importance to a number of railway companies, as it involves the right of a city to claim the extension of the city fare of an electric railway in districts annexed to the city subsequent to the agreement between the city and the railway.

The decision first rehearses the history of the case, telling that the Detroit United Railway, which was incorporated in 1900, united under one organization certain lines previously constructed and operated independently in the city and its suburbs under different and distinct franchises. Among these were the Detroit City Railway and the Grand River Street Railway, each in the city of Detroit with a franchise which required the sale at certain hours of eight tickets for 25 cents, and the Grand River Electric Railway in the township of Greenfield without this provision. The Grand River Electric Railway was a different corporation than the Grand River Street Railway. In 1905 and 1907 the city annexed part of Greenfield township and claimed that the low rate of fare mentioned was applicable to all of the lines of the Detroit United Railway within the city, not only as its limits existed in 1889, when the Grand River Street Railway received a franchise to extend its tracks to the city limits, but also to the lines in the territory annexed in 1905 and 1907. In the legislation authorizing this annexation it was stated that the annexed territory should be subject to all the laws of the State applicable to the city and to all the ordinances and regulations of the city, with exceptions not material to this case. The railway company took the case to the State Supreme Court on the ground that these acts were in conflict with Sec. 10 of Art. 1 of the Federal constitution.

The decision delivered by Justice Pitney then discusses the question of jurisdiction in the case. It says that the United States Supreme Court has many times decided that the "contract clause" of the constitution is not intended to cover "such impairments of contract obligations, if any, as may arise by mere judicial decisions in the state courts without action by the legislative authority of the state. But in this case there were state laws passed subsequent to the making of the alleged contracts in question, in the form of the legislation of 1905 and 1907 extending the corporate limits of the city; and it is not correct to say that the decisions of the state court turned upon the mere meaning of these contracts without reference to these subsequent laws." "It is too well settled," the court says later, "to be opened to further debate that where this court is called upon in the exercise of its jurisdiction to decide whether state legislation impairs the obligation of a contract, we are required to determine upon our independent judgment these questions: (1) Was there a contract? (2) If so, what obligation arose from it? and (3) Has that obligation been impaired by subsequent legislation?"

The decision then takes up the question as to whether, by voluntary action of the parties between the making of the suburban grant and the passage of the annexation act, the obligations arising out of these grants had been modified, and holds that they were not. It says: "Defendants in error invoke the established rule that the terms of a municipal grant or franchise should be construed strictly as against the grantees and as favorably to the grantor as its terms permit. The state court deemed the rule to be applicable. It is at least doubtful, however, whether the rule, properly applied to the facts of these cases does not bear altogether in favor of plaintiff in error. For, of course it is not possible to adopt an extensive construction of the obligations imposed upon the city companies by the ordinances without adopting a like construction as to the extent of the franchises thereby conferred upon the companies. And can it be supposed that if either of these companies had claimd the right to lay down tracks and operate railways in the annexed territory by virtue of the ordinances of 1889, they would not have been met with the rule that municipal grants are to be construed strictly against the grantee, and cannot be extended beyond their expressed terms?"

The decision then goes on to say that "if the city lines had been extended into the annexed territory by either of the city railway companies under any authority conferred by or assumed under the ordinances of 1889, a very different question would have been presented. But such is not the case. We find it impossible to regard the purchase of suburban lines, with their rights, privileges and franchises, as being in effect an extension of the city lines, but at the same time an abrogation of an essential part of the rights and privileges appurtenant to the acquired lines. . . . And since the judgments of the Supreme Court of that state (Michigan) gave such an effect to the annexation acts of 1905 and 1907, in conjunction with the ordinances of 1889, as to impair those obligations, the judgments must be reversed."

A short dissenting opinion was presented by Justice Clarke, who added that he was authorized to state that Justice Brandeis concurred in this dissent.

A. S. C. E. Valuation Report Prepared

Work of Five Years Results in Enunciation of Principles Which Should Control Valuation of Normal Public Utilities—Report Should Clarify This Involved Subject

AFTER five years, during which forty-eight joint meetings have been held and a voluminous correspondence aggregating thirteen substantial volumes has been carried on, the special committee of the American Society of Civil Engineers has prepared an exhaustive report as to the principles and methods to be followed in the valuation of normal railroads and other public utilities. The report, which is published in the December *Proceedings* of the society, contains 230 pages, the report proper being preceded by a twelve-page abstract prepared by the committee. This abstract, somewhat condensed, is published below.

The report of the committee is to be presented to the society on Jan. 17, but it is suggested by the committee that the discussion be continued in writing and that the report be finally presented at the next annual convention in June. The report is signed by Frederic P. Stearns, chairman; Leonard Metcalf, secretary, and William G. Raymond, Jonathan P. Snow, Charles S. Churchill, Henry E. Riggs and William J. Wilgus, the last three having been appointed in 1914 to fill vacancies.

Noteworthy Findings

Estimated original cost is not dependable; original topographical conditions but present-day prices and methods should govern in estimating reproduction cost; all real items of cost but no "higher use" value should enter into the reproduction cost of land; only when provision is made in the rate, or should be in the accounting, for an accumulating fund should a depreciation deduction be made for loss of service life, this to be offset by the fund; and development expense and going value are distinct, the one tangible and the other intangible.

Fundamental Principles of Valuation

In the opinion of the committee the principles and methods must be such that when properly applied the result will be fair to all parties affected and of a nature that will attract to the service of the public capital to build new properties and extend old ones.

New Properties—In the valuation of a new property, if the question of a fair return is at stake, the actual investment in the portion devoted to public use, including working capital and development expense, should be taken as the basis for "fair value." If the same property is to be valued for public acquisition, the basis of "fair value" should be the actual cost, including the money value of services and other considerations involved. If the valuation is to be used for capitalization, the result should be attained in the same way as the return base, except that all parts of the property should be included. If for taxation, whether of a new or old property, the result must accord with the laws of the state, or, where not governed by such laws, should be fixed at a sum consistent with the valuation of other property for taxation.

Old Properties Under Continuous Regulation—In the valuation of an old property, operating without competition and from its inception under commission control as to rates and methods of accounting, and assumed to have been entitled to earn sums sufficiently large to provide for all expenses of maintenance, operation and taxation, depreciation allowances and a fair return on the "fair value" of the property, the owner should be compensated in some way for losses sustained during the early years of operation before the property was tuned up and the business developed, either by including in the valuation the sum of the deficiency of earnings in the early years, with interest compounded annually, or by allowing higher rates of return in subsequent years to offset the early deficiency.

Old Properties Not Under Continuous Regulation—In the valuation of an old property which has not been subject to continuous regulation, not only are the foregoing principles important, but there are many cases in which equity calls for the inclusion of not only the sum representing the sacrifice by the owner but also a further positive or negative sum representing valuable property or rights acquired or lost by the owner as a result of time or through the failure of the public or the owner to assert their authority, the courts holding that the present value of the property should be used rather than its cost.

Physical Property Included

The physical property to be included varies in different cases with the use to which the valuation is to be put and the law governing the case.

Used and Unused Property—In cases of rate regulation, only the property considered devoted to public use should be included, embracing that in active use and also that properly and reasonably held in reserve to insure the safety, economy, sufficiency and continuity of service. In valuations for capitalization and public acquisition all the property should be included.

Retired or Discarded Property—Plant units definitely abandoned and not likely again to be used, due to having been worn out in service or by reason of the reconstruction of the property, should be excluded from the valuation and should appear either in a separate schedule of retired or discarded property, or such full statement of the conditions should be made as will definitely fix the status of the units or parts. Temporary works necessarily built in connection with, or required for, the construction of permanent works, or for furnishing service to the public at an earlier date than it could be furnished by the permanent works, should be included in the valuation.

Excessive Size or Capacity—No reduction should be made in the valuation on account of excessive size or capacity, except when the excess is so great as to be clearly unreasonable and is the result of not using proper foresight.

Donated Property—Lands or other property voluntarily donated to a public utility should be included when determining the reproduction cost, on the same basis as land and property otherwise acquired.

Leased Property—In the case of leased property, either the property itself or the lease should be valued, as circumstances may dictate.

Title to Property Not Conclusive.—Structures located on land to which the owner of a public utility has no title should be included in the valuation of the property where the owner has been required by law or necessity to pay their cost, including in this class also property voluntarily donated; and they should be excluded where other public service companies, the public or the users, other than the owner in question, have been required by law or necessity to pay their cost.

Working Capital—It is customary to include under the term "working capital" the amount of cash, materials and supplies provided for use in the plant, but not yet forming a part of it, and other current assets essential for proper maintenance, operation and administration. There should be included an amount of working capital sufficiently large not only to meet the usual requirements but to provide for emergencies.

Securities Owned—Ordinarily, the valuation of property devoted to public use should not include securities owned, or surplus cash not forming a part of working capital, except in instances where such securities and surplus cash are an offset, in whole or in part, for depreciation deducted from the cost of the property.

ORIGINAL COST TO DATE

As defined by the committee, original cost to date is the first cost of the identical property units now in use, including overhead charges.

Difficulties—While much of the difficulty of determining original cost as thus defined in some cases may be removed, especially in the case of short-lived property, it is not feasible to obtain a dependable result where the absence of reliable historic data makes necessary a resort to estimates, as in the case of old properties consisting mainly of long-lived items.

Schedule—Generally it will be found necessary to prepare a schedule in the same way that one would be made for determining the cost of reproduction, many adjustments in the records often being required, even under the most favorable conditions, in order to obtain correct results.

Costs—Unit Costs—When a schedule is necessary, the corresponding costs or unit costs are essential to the completion of the inventory, and where these are unobtainable, as is usually true in the case of property units acquired or created long ago, the ascertainment of the original cost is impossible.

Overhead Charges—Overhead charges are, as a rule, inadequately reflected in the records, and therefore adjustments are required which are largely matters of opinion and speculation, and which, in consequence, make more uncertain the final result, thus often destroying its usefulness.

Development Expense—The expense actually incurred in connection with the tuning up and creation of the business of a property should be included as a part of the original cost to date.

COST OF REPRODUCTION

Estimates of the cost of reproduction should be based on the assumption that the identical property is to be reproduced, rather than a substitute property; that while apparent present-day conditions that would affect the cost of reproducing the property must be considered in any logical estimate, yet history must also be considered to determine what is to be reproduced, the conditions under which it is to be reproduced and how the estimates must be made, and that normal present conditions shall determine the prices and methods for doing the work.

Preliminary Work—The first step in estimating reproduction cost is such a study of the property and its history as will enable the estimator to make a complete list of all items and lay out a proper financial and construction program. The field schedules and inventories should not only be based on complete inspections of the visible physical property, but should also reflect a careful historical search of existing records and other reliable sources of information bearing on items of material or work which entered into or were incidental to actual existing units, special care being exercised to limit the speculative uncertainties as far as possible.

Unit Prices—In determining unit prices a rational sequence of construction should be assumed, and rational assumptions made as to the manner of doing the different parts of the work, whether by company forces or by contract. Unit prices based where possible on the actual cost of doing similar work, in a similar manner, under similar circumstances, should be determined by persons of experience and sound judgment. They should be based on the normal average cost of work for a considerable period—say, five or ten years. In the case of items which are steadily increasing or decreasing in value, the prices adopted should be normal for the time of the valuation. Full consideration should be given to the time allowed for construction, to climatic conditions and to the effect of any other significant conditions or limitations upon the cost of the work.

Reproduction Cost of Land—The determination of the figure to be used should be based in all cases on full consideration of the present normal market value of the area of land acquired and of other recent purchases by the same or other companies of similar lands in the vicinity or in districts of like characteristics; the damage to the remaining land, not required, due to severance and all consequential injuries; the amount and character of the costs of acquisition and overhead charges; enhanced prices due to active demand, and any other real items of cost which would be included in case of purchase. But no allowance should be included for special values coming after the acquisition of the property on account of its new use or on account of a greater earning power under the new use, or for any other hypothetical "value." Estimates should be based on prices and values as of the time of appraisal, be they higher or lower than those prevailing at the time of original acquisition.

Overhead Charges—These charges are a necessary and proper part of cost but are not capable of physical identification after the completion of construction work. They cannot be covered in the estimate of cost of reproduction by the application of specific unit prices; from their nature they attach to the whole or large parts of the property rather than to any particular units. Among such charges are:

(*a*) Cost of promotion.

(*b*) Cost of financing and securing the necessary capital with which to carry out the enterprise.

(*c*) Cost of organization, including the incorporation and organization of the company, securing of franchises, and other like expenditures.

(*d*) Engineering, including the making of the preliminary investigations and plans, plans for the construction of the entire property, the engineering supervision of all construction and other work involved in the development of a property, except such direct supervision as may properly be included in the unit prices of various property units, or as specific charge against some particular schedule or group of units.

(*e*) Administration, including salaries for general officers, agents, accountants, clerks and other assistants not included in the engineering and legal departments, and all administration expenses.

(*f*) Legal expenses, including salaries and expenses

of law officials and costs of litigation which, depending on the character of the property and its location, may be a comparatively minor item or a very large one.

(*g*) Interest during the period of construction.

(*h*) Taxes and insurance during construction.

(*i*) Contingencies.

How Depreciation Should be Handled

With a desire to remove the ambiguity and resulting confusion that has attended the use of the term "depreciation" in connection with valuation, the committee has considered the subject from three standpoints: (1) The cause, *decretion* or loss of service life; (2) the record, *accounting depreciation*, or the money allowance made in bookkeeping to offset accruing loss of service life; and (3) the amount sought, *depreciation of valuation* or *fair depreciation*, the sum which should be deducted from original cost to date or from estimated cost of reproduction new as a step in finding that which the courts have called "fair value."

Decretion or Loss of Service Life—Decretion is the fact of loss of service life of a physical property, property unit or item, regardless of its effect on value or anything else. It may be due to use, inadequacy, obsolescence or accident, either singly or in combination. Although, in a well-maintained property, decretion is always present in some degree, yet in some cases this decretion, converted into loss of value, which loss is hereafter called cost of decretion, should not be considered deductible in finding property value.

Accounting Depreciation.—The fundamentals of the methods of accounting for depreciation are that the owner of a public utility is under obligation to the investors in its securities to maintain the integrity of the investment as a continuing property and to furnish suitable service to the public; that the public is under obligation to the owner to pay a fair price for the service rendered, which should cover all operating expenses, a proper allowance for depreciation and a fair return upon the "fair value" of the property, and that the return to the investor and the rates to the consumer should be kept reasonably stable and uniform from year to year and should be fair.

The four methods that may be used in connection with accounting for depreciation, the replacement method, the straight-line method, the compound-interest method (formerly called by the committee the "equal-annual-payment method"), and the sinking-fund method, yield identical total costs when the whole life of a property unit is considered, and any one of them seeming to be the most convenient may be chosen, provided under the circumstances it is legal, safe and fair.

The replacement method is applicable to short-lived properties or parts of properties made up of a large number of items, the replacement or retirement of which proceeds after a time with fair regularity and causes no troublesome variations in return or service rates. The straight-line method applies to property units having more than a year of service life, which are assumed to depreciate uniformly from the beginning to the end of service life. The compound-interest and sinking-fund methods apply to property units the depreciation of which is assumed to progress at the same rate as a sinking fund grows from an annuity, accumulating at compound interest.

Depreciation of Valuation—Finding the cost of decretion is a step in the determination of depreciation, but whether and to what extent, if at all, the estimate thus found shall be treated as depreciation of valuation may be, and very probably will be, dependent, at least in part, on the methods of accounting for depreciation and the character of regulation that have prevailed.

If by order or sanction of a regulating body, or by long-continued proper custom under no regulation, a property, as for instance a railroad, has been maintained in normal working condition, necessarily less than new in some or all of its parts, by the replacement method, and at any given date is being valued for any public purpose and at that date shows normal condition, all its several parts being in as good condition as could be expected, the accounts showing that those amounts have been expended in renewals that were necessary to keep the property in normal working condition, and the fact appearing that no expenditure reasonably to be expected could put the property in better than the normal condition in which it is found, and that no unusually large expenditure is presently to be necessary for this purpose, then, in spite of the fact that there is an existing decretion in its several parts, there should be found no depreciation of valuation. Under the method of accounting the public has not paid, and could not pay, for the accrued depreciation, and under this condition its accrued obligation to pay should be considered a company asset.

If parts of the property are maintained under the replacement method and part by some proper allowance method, except as noted below, then depreciation of valuation should be found with respect to those parts maintained under the allowance method, but this depreciation of specific physical units will be made good in whole or in part by existing funds or property purchased with allowances, either or both of which will be included in the valuation as they are found.

If in the judgment of the valuing engineer the replacement method may not be used with propriety for a given property, either because not in accordance with law, or because the method is not adapted to the property, then, whether or not the property has been maintained in the past under this method, the valuing engineer should estimate depreciation of valuation in the amount of the cost of the decretion he finds.

When a comparatively new property, other than a railroad, is to be valued, and it has not been under any regulation that has affected its accounting methods, the law as laid down in the Knoxville decision would seem to make it necessary to find depreciation of valuation equal to the cost of decretion found for all items, whether or not maintained by the replacement method. This might sometimes be unjust; the engineer should then report facts with recommendations as to equity.

If the straight-line, compound-interest or sinking-fund method has been used in computing depreciation, and the method of accounting for it has been prescribed by a regulating body or voluntarily followed by a company owner from the beginning, the same theory, as far as it applies to the property in question, should be used for estimating the cost of decretion; and the entire cost so found, lessened by any accumulated depreciation funds, will appear as depreciation of valuation, unless the sinking-fund method of accounting has been used. In the latter case, if the valuation has to do with the reasonableness of the return and the accounting is to go on as before, apparently existing depreciation would not be depreciation of valuation, and therefore would not be deductible; but if the valuation has to do with condemnation or purchase, then, as in other cases, the apparently existing depreciation is depreciation of valuation, and the owner should receive the depreciated value of the physical property and the existing fund.

Methods of accounting in force at the present time which make proper provision for the accruing depreciation should not have full weight if, in previous years during the life of the property units, other methods were in use which did not make provision for such de-

preciation. The amount of depreciation of valuation in such cases should be equivalent to the accumulated contributions of the public for depreciation allowances under the various methods of accounting which have affected the property unit from time to time. The public is still under obligation to make good that part of the loss of service life not yet paid for, and this obligation should be considered as much the property of the company usable to offset accrued depreciation as renewal funds or property actually in existence.

If regulation has not fixed accounting methods, but has limited the earnings, it should be permissible to inquire whether the limited earnings have been sufficient to pay operating expense, depreciation, and fair return. If so, depreciation found should be considered depreciation of valuation to the extent warranted by the accounting methods lawfully or properly followed; if not, a question arises. It is remembered that the duty of the company owner is first to maintain the property "before coming to the question of profit at all," and that it is the duty of the regulating body to see that rates are such as to permit the company owner to earn operating expenses, depreciation and fair return. If the regulating body has made sufficient earnings impossible, is it still the duty of the company owner to maintain the property before paying fair return to its security holders? If it is, depreciation of valuation should be found in the amount of the total cost of decretion or so far as warranted by the accounting methods followed. If not, depreciation found should not be considered depreciation of valuation except to the extent covered by earnings after deducting operating expenses and fair return. This is a matter of equity to be determined by a court.

The valuing engineer should bear in mind that when a company has invested a reasonable sum in a property for public service, it is entitled to, but not guaranteed, a fair return on its investment, so long as the money remains in the property, either as property, funds or accrued public obligation to pay. Therefore, so long as the owner keeps a sum equivalent to the total investment at work for the public, either as property serving the public or funds held in reserve for such property, no policy should be followed in estimating depreciation that will reduce the property to a value less than the investment, or, when using cost of reproduction less depreciation as a basis of "fair value," to a value less than the cost of reproduction of that part of the property estimated to have been created with company funds or acquired by gift or in any way not the result of public contributions to cover depreciation.

Appreciation

Appreciation, largely the result of solidification, seasoning and adaptation, represents the improvement in quality and usefulness of certain parts of the physical properties of a railroad or other public-utility property. It results from the lapse of time, from work not specifically charged to capital account, from maintenance, from use, etc., and covers items, not represented either by the quantities or unit prices, that are determined in connection with a valuation. There should be no general setting off of appreciation against depreciation, but appreciation should be determined independently from depreciation. Care must be taken that items of labor and expense included in the estimate may not be duplicated in development expense.

Development Expense and Intangible Value

In the production of a normal going property, development expense almost invariably is an unavoidable real cost, and is measured by the difference between the amount which the company is entitled to earn in the early years and the amount which it actually does earn. The portion of this expense incurred in tuning up the property and bringing it to its present state of operating efficiency may be included in the cost of construction, and the remainder may be treated as the cost of acquiring the business.

The intangible value that pertains to a property and should be given due weight in the ascertainment of "fair value" is the difference between the tangible value —that is to say, proper cost including development expense, less depreciation of valuation—and exchange value, in which is reflected existing and potential dependable income and beneficial results. It embraces going value, in which is merged good will, franchise value, efficiency, favorable business arrangements and design; and other elements, such as leases, easements, water rights, traffic and operating agreements, strategic location and advantages, and other privileges.

With reference to intangible value as a whole, the committee takes the ground that, in finding original or reproduction cost, there must be included, first, the tangible elements, which can be separately scheduled with an attached value based on concrete facts, and, second, that pertinent facts bearing upon intangible values should thereafter be developed independently, as an aid in the formation of sound judgment as to their value. Exceptional efficiency should be recognized by courts and commissions when appraising property.

Results of Kansas City Railways Safety Campaign

The excellent work in promoting public observance of safety and attention to the subject by the Kansas City (Mo.) Railways is conceded to have been chiefly responsible for the success of a week's campaign for members by the local Safety Council of Kansas City. C. W. Price, field secretary of the National Safety Council, assisted in the campaign, which netted about thirty new members. The local Safety Council has grown from fifteen to more than sixty members in two months. In nearly every case the firm visited expressed itself as eager to participate in the safety work, and signed the application. In several cases secretaries of central organizations asked for material which they could send to their members with letters urging them to join the national council. An association of business men was addressed each noon, and three of the high schools devoted their weekly program to safety.

Washington Railway Relief Paid $13,000

Nearly $13,000 was paid out in sick and death benefits by the Washington Railway Relief Association during the year ended Sept. 30, the annual statement of the association shows. The organization is composed of about 1200 employees of the Washington Railway & Electric Company, Washington, D. C., who are assessed at the rate of $1 a month. For the past year each member received a refund of $8.77, which made the insurance cost exactly 27 cents a month. The sum of $9,485 was paid out in sick benefits and $3,270 in death benefits, the total showing an increase of $4,404.25 over the amount paid out during the preceding year. Since its organization, sixteen years ago, the association has disbursed more than $100,000 on account of sick benefits and $33,000 on account of death benefits, and now has cash and securities on hand amounting to $100,651.

MID-YEAR MEETING BOSTON FEBRUARY 16, 1917

ASSOCIATION NEWS

MID-YEAR MEETING BOSTON FEBRUARY 16, 1917

Motion-Picture Film Showing the Development of Transportation Displayed at Portland Company Section Meeting—Capital Traction Section Celebrates Its First Anniversary—Signals and Heavy Traction Were Discussed at the Connecticut Company Section Meeting

"King of the Rails" Film Shown in Portland

Two hundred persons sat down to supper preliminary to the Dec. 20 meeting of the Cumberland County Power & Light Company section. After a short business session, at which seventeen new members were admitted, the meeting was turned over to the entertainment committee. The section orchestra made its debut, and singing and exhibition dancing also contributed to the success of the evening.

M. R. Griffith of the Boston office of the General Electric Company showed and explained a motion picture film entitled "The King of the Rails." This showed the development of transportation from the early days, leading up to the Chicago, Milwaukee & St. Paul Railway electrification.

First Anniversary Celebration of Section No. 8

On Jan. 11 the Capital Traction Company section celebrated the first anniversary of its founding with an attendance of 130. George E. Hamilton, president of the company, was the principal speaker. Greetings from the Washington Ry. & El. Co. section were presented by President J. T. Moffett. A talented local cartoonist gave a "stunt" chalk talk, and a number of those present furnished good music. A buffet lunch was served at the close.

In congratulating the section upon the completion of a successful year's work Mr. Hamilton said that this effort to bring the men into closer touch, to teach them to look broadly at their work, was one of the best things that had ever come into the life of the company. He repeated some things which he had said a year before, in part as follows:

"I am a believer in the association of men, especially of men engaged in the same or similar work. It gives opportunity for useful discussion, and discussion aids thought, stimulates inquiry and invites criticism. It produces knowledge and concentrates effort. It promotes good fellowship and teaches men the value of coordination in view, effort and direction. It is good for the men and good for the interests they serve. Association develops organization, and organization promotes efficiency; efficiency is power, and power well directed compels success. So I am a believer in and an advocate of this association, and my sympathy and cooperation, personal and official, is with the intent and purpose of this meeting. We serve ourselves when we serve well the company and the public, and the fact that we are a public service corporation should never be forgotten. The least of us can by association and all that association brings take on the strength, that comes with a fuller knowledge and a wider understanding, to meet manfully and well our three-fold duty: to ourselves, to the company and to the public we serve."

Continuing this line of thought Mr. Hamilton said in part:

"An organization of this kind brings us together, makes us all see what each is doing, and gives new impetus to our minds and a firmer and a fuller purpose to every man who is striving to do what is right. It teaches us what a service corporation is; shows us that because we are members of this service corporation we have assumed duties that we cannot lightly consider, duties that will compel us thoughtfully to perform all of the obligations that we assume. It shows us the part that each is playing in the performance of this duty. If we learn our lesson well, if all of us engaged in this common enterprise feel and, feeling, measure up to the obligations that we assume, then indeed are we doing the work of men.

"This close contact teaches us more. It brings into the lives of all of us the spirit of service and teaches us what service is."

January Meeting of Section No. 7

Signals, heavy traction and boosting the company were the topics discussed at the twelfth meeting of the Connecticut Company section held on Jan. 9. The usual dinner was held, with an attendance of 125 members and guests, after which George Pfurr, general line foreman Waterbury division, gave an illustrated talk on "Signal and Dispatching Systems Used on the Waterbury Division." He described the working mechanisms forming parts of these systems.

The next speaker was Nathan B. Stone, president of the publicity club of the Chamber of Commerce of New Haven, who chose for his topic "Lux et Veritas." With this as a basis he explained what the public expects from the street railway, and suggested several ways of boosting the Connecticut Company.

George H. Hill, assistant engineer railway and traction department General Electric Company, Schenectady, N. Y., then spoke on the C. M. & St. P. Railway electrification, using lantern slides and moving picture films.

During the dinner the section orchestra played and two soloists gave vocal numbers.

Western Society of Engineers Elects Officers

At the forty-seventh annual meeting and dinner of the Western Society of Engineers, held in Chicago on Jan. 10, the result of the election of officers was announced as follows: President, H. J. Burt, structural engineer Holabird & Roche, Chicago; first vice-president, D. W. Roper, superintendent street department Commonwealth Edison Company, Chicago; second vice-president, J. N. Hatch, consulting engineer, Chicago; third vice-president, W. W. DeBerard, Western editor *Engineering Record*, Chicago; treasurer, C. R. Dart, bridge engineer Sanitary District of Chicago.

James Keeley, editor and publisher of the Chicago *Herald*, addressed the meeting on the conditions in Europe and what may be expected after the war, and Dean F. E. Turneaure of the University of Wisconsin made some remarks on the relations of the engineering school and the engineering profession.

COMMUNICATIONS

Advertising in Company Publications

[NOTE.—The letters printed below were received in response to an inquiry addressed by the ELECTRIC RAILWAY JOURNAL to three of the companies which publish employees' magazines without advertising of the character criticized editorially in our issue of last week. This inquiry was designed to bring out the reasons for the policy followed by these companies. We shall be pleased to print other comment by our readers on this subject, in which we believe an important and fundamental principle is involved.—EDS.]

UNITED RAILWAYS COMPANY OF ST. LOUIS
ST. LOUIS, MO., Jan. 8, 1917.

To the Editors:

Answering your inquiry as to the policy of the United Railways Company of St. Louis in soliciting advertising for the monthly bulletin which we publish for the information of our employees, I will state that when this publication was first suggested we considered the matter of soliciting advertising to pay for a portion of the cost of the magazine.

We decided against such solicitation for the reason that we felt that any such advertising would be given, not because the advertiser desired it for its publicity value, but because he would regard such solicitation as a demand from the Railways Company which he could not refuse. We do not wish to place ourselves in the position of making such demands, and furthermore, we wished the publication to be entirely independent and not have the editor feel that he was under obligation to any advertising concern.

Our *United Railways Bulletin* is now two years old and has increased in size from twelve to twenty-four pages, with a circulation of about 10,000 once a month, and we have no reason to contemplate a change in our policy. RICHARD MCCULLOCH, President.

VIRGINIA RAILWAY & POWER COMPANY
RICHMOND, VA., Jan. 8, 1917.

To the Editors:

In reply to letter of Jan. 5 on the subject of employees' magazines I desire to say that we are heartily in accord with the views of W. S. Thompson of the Grand Trunk Railway in reference to advertising in company publications.

The whole value of such publications in the street railway business is to establish a live contact between the company and its patrons. To carry advertising we believe would needlessly antagonize private enterprises engaged in the various branches of the advertising business who would resent the intrusion of a new advertising agency entering a "closed field."

If we were to consent to carry advertisements, the easiest way to get such advertising would be to appeal to concerns from whom we purchased supplies. These concerns could expect no benefit whatever from the publicity gained; hence their only motive in complying with the request for such advertising would be to ingratiate themselves into the favor of the company and in the last analysis one cannot escape the conclusion that this would really be a form of graft. For a company publication to recognize this practice is, to our mind, a serious blunder, and we are glad that the question is being so thoroughly discussed through your valuable paper. THOMAS S. WHEELWRIGHT,
President.

NEW YORK MUNICIPAL RAILWAY CORPORATION
BROOKLYN, N. Y., Jan. 8, 1917.

To the Editors:

I have your request for my views on advertising in company publications. The primary question in regard to local advertising, it seems to me, is what one can afford. If a company is able to get out a publication for free distribution, carrying no advertising and using covers and other prominent positions for art work, educational bulletins, etc., it is obvious that such publication will be more attractive and probably will make a more effective appeal than a publication in which advertisements are carried.

An employees' publication, it seems to me, should be a subject of pride among all those who are responsible for it. If its full value as a unifying influence is to be realized every member of an organization from the president down ought to take a personal interest in having just as high a grade of publication as it is possible to produce.

I have examined most of the company publications of this kind that have appeared in recent years, and I think I am justified in saying that this examination gives evidence that the relative degrees of success attained by such publications have depended on the interest taken by all connected with the management of the companies producing them, from the highest officers down, in making them dignified, interesting and typographically attractive.

Every publication, whether it is a company magazine or a daily newspaper, develops a personality. This personality usually becomes that of the persons who produce it and reflects their attitude toward it. The publication is the child of their brains and will be characterized by regard or disregard for truth, by fairness or unfairness, by courage or timidity, by good taste or bad taste, according to the controlling characteristics of those who produce it. It will also reflect the extent of their interest in it when it is once born. If it becomes an untidy child, if it cheapens itself by poor English, vulgarity or other evidences of bad taste, this will mean either that its producers are similarly disposed, or else that they care little about it and have abandoned its bringing up to some person or persons who reflect these characteristics.

If I am correct in the foregoing analogy, it is evident that no pains should be spared in producing the best possible type of company publication, for whatever influence it may exert must necessarily be for the development in its readers of the qualities which it thus embodies.

However, to return to our analogy, a family does not cease to be respectable if, through limitations of income, some of its members are called upon to earn money. Plainly the propriety of such a situation depends upon the character of the work done. The head of a household who would allow his children to perform manual labor beyond their strength, or who would allow his neighbors to give them employment in nominal tasks in which they could render no real service, would obviously increase the family income at a sacrifice of self-respect. No one, however, would criticise a boy who performed suitable work, giving fair value for what he earned, either for the purpose of helping out the pocketbook of a family in straitened circumstances or for the purpose of securing spending money over and above what his father could allow him.

The situation is the same with company publications. While the feeling of pride which should be taken in the attractiveness of a publication would naturally disincline a company, that could afford to produce one without advertising, to enter the advertising

field, nevertheless I see no objection, involving manners or morals, to the acceptance of proper advertising where this is necessary in order that the publication may be produced, or where it affords the additional income necessary to make the publication thoroughly attractive. Any publication which circulates among several hundred or several thousand employees, in a given city or in various cities which may be centers of industry has, of course, a definite value for certain classes of advertisements. A publication whose circulation is confined to one city only ought to be a very desirable medium for local stores, theaters and all other classes of strictly home advertisers, because if its standards of excellence justifies continued existence, it is bound to be read from cover to cover by its clientele. This sort of reading creates an element of advertising value quite distinct from the size of the circulation and enables certain well-known periodicals with very limited circulation to command the highest rates paid by advertisers in their respective fields.

A publication issued in several different industrial centers where any large company may have plants ought in any event to have certain pages devoted to local news in each plant which would, in the interest of economy, make it desirable to have separate editions. Each such edition, however, could develop its own advertising along local lines, if for any of the reasons indicated above it is necessary to carry advertising.

I do not think it necessary to characterize the impression which would be made on any intelligent person by a company publication which solicited or accepted advertisements from concerns from which it was purchasing supplies or to which it sold its product. If such supplies were required by its employees the company would do better to arrange to obtain them on the lowest possible terms through its own purchasing machinery, which would not require advertising on the part of the dealers. If its own product is one which its employees have occasion to purchase, then the company had better sell to them direct on the most reasonable basis possible.

I do not recall any instances of company publications that have come to my attention which have offended the proprieties in this way, and I add this to my discussion only that it may cover fully the conditions to which it is addressed.

HARRY A. BULLOCK,
Secretary.

Spacing of Subway Stations

Massachusetts Commission Points Out That Interests of Greatest Number of People Must Be Considered

IN a hearing held recently by the Massachusetts Public Service Commission on a petition for another subway station in Cambridge, brought by some citizens of that city, the commission discusses the general subject of the proper spacing of stations and the principles which should govern. It said that it would consider this question on its merits without admitting the power of the commission to compel the company to construct a station at the point suggested, if that should prove desirable.

The proposed location is about half-way between two existing stations which are about a mile apart. The petitioners pointed out that on other subways and rapid transit lines, both in Boston and other cities, notably New York, the stations are usually located at intervals of about a half mile, but the commission declares that the conditions affecting station location in the business districts of Boston are so different from those which exist in the suburban districts served by the Cambridge subway as not to be properly comparable. In New York, the commission says, the conditions are also so different as to make a comparison of even less value, as local and express service is conducted in the same subway, and the average distance between the express stops from Brooklyn Bridge north is about 1.66 miles.

The petitioners further stated that the installation of the new station would largely increase property values in the vicinity and prove of great economic value to the city, but the commission held that for it to stimulate artificially real estate development in Cambridge at the expense of similar development in other communities would be an arbitrary and unwarranted exercise of authority. It also pointed out that the saving in time to those who would use such a station would be more than overbalanced by the loss of time by others living farther out who would be delayed by the station stop. the company had testified it would cost $60,646 a year to operate the station, and its installation would be an entering wedge which would tend to decrease the value of the subway as a rapid transit line serving more distant suburbs as well as Cambridge. The petition was, therefore, dismissed.

Canadian Compulsory Investigation Act

Adoption of Principle in This Country Would Grievously Disappoint Even Its Most Ardent Advocates

IN view of the present administrative program for adopting in this country the principle of the Canadian compulsory investigation act, Ralph M. Easley, chairman executive council National Civic Federation, New York, has issued a statement regarding what he deems to be the unsuccessful workings of the Canadian act and the impropriety and uselessness of passing a similar act for the United States. This act was described in the ELECTRIC RAILWAY JOURNAL of Nov. 25, 1916, page 1107. According to Mr. Easley the official reports of the Board of Conciliation to the Labor Department of Canada on the operation of the act from its passage in 1907 to 1916 furnish enough information to dissipate all belief that an industrial Utopia has been developed in Canada.

In the whole nine years the Canadian act dealt with disputes involving only 146,000 employees, and 32,000 of them, or nearly 22 per cent, struck in spite of the award, and in many cases in spite of the law itself before making an application for an investigation. Nothing in the record shows that any attempt was made to inflict the penalties of the law by fining them or sending them to jail. The Canadian act, it is asserted, was not intended to prohibit strikes and it does not prevent them. It is intended only to delay them until after a board has heard both sides of the issue and made a public recommendation, after which either side or both sides, as has happened in Canada again and again, can go ahead and fight it out.

Mr. Easley believes that the adoption of the principle of the Canadian act in this country would not only grievously disappoint the hopes of its advocates, but would tend to make of wage-earners here a horde of lawbreakers. The issue cannot be met by any form of compulsory legislation. Some sort of a mediation board, named by the President and mutually agreed upon by the railroad managers and the brotherhood leaders, under federal supervision, would help the present railroad situation. It would not absolutely prevent a recurrence of the crucial situation of last autumn, but in Mr. Easley's opinion there is no scheme which would be an absolute preventive.

Short and Up-to-Date Articles on

EQUIPMENT AND ITS MAINTENANCE

Remodeling Motors on Third Avenue Railway System—Prolonging Life of Rails in Connecticut—Protecting Roadbed on Water-Retaining Soils on B. R. T. System—Automatic Car and Air Coupler—Spring Type Post Casing for Car Windows—Contact Signal for Cleveland & Eastern Traction Company

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

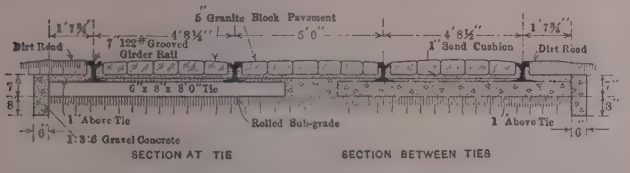
Concrete Baffle Walls in Protection of Roadbed for Water-Retaining Soils

The Plan of Keeping the Water Out Rather Than Draining It Away Was Preferred in the Case Cited

BY R. C. CRAM
Assistant Engineer Way & Structure Department, Brooklyn Rapid Transit System

During an investigation of soil conditions precedent to the construction of the Eighth Avenue extension from Thirty-ninth Street to Bay Ridge Avenue, Brooklyn, it was found that a soil of a character likely to retain considerable water would have to serve as the roadbed for the new tracks. A rather unusual condition was thus presented, as most of the soils found in Brooklyn are gravel and sand, or sandy loam, retaining little water, and these have been found generally suitable for sub-grade foundation without resort to special drainage or the use of concrete platforms or ballast under the ties. The necessity of some method of drainage therefore became evident.

The need for keeping water-retaining subsoil dry was recognized, particularly as no protecting pavement was to be installed in the adjacent roadways



CONCRETE BAFFLE WALLS FOR PROTECTION OF SUB-GRADE IN HEAVY SOIL

which would conduct the surface water away from tracks, but instead of installing a subsoil drainage system it was decided to construct small concrete baffle walls at the outer edges of the concrete base necessary for the granite track pavement. They were constructed as a part of the paving base and the small trenches required to form the walls were made in the soil shortly before the installation of the concrete so as to avoid the necessity for using the usual forms.

A glance at the accompanying cross-section will show that the adjacent roadway surface must become thoroughly saturated with water to a depth of over 21 in. before the moisture can pass to the subsoil directly under the tracks. It is believed that it is practically impossible for this to occur and that the subsoil will be kept dry. As dry clay soils of the character found will sustain any load which can be placed on it by means of street railway tracks, the tracks should remain in good surface until the city can pave the adjacent roadway, which may not be done for a period of several years.

A Large Job of Motor Remodeling

An Eastern Railway System Has Been Able to Reduce Maintenance Costs on Old Motors to a Reasonable Value

BY R. H. PARSONS
Electrical Foreman

When the present management of the Third Avenue System of New York took charge about ten years ago the road was equipped with some 600 Westinghouse No. 56 motors. These motors had previously been a source of continual trouble, especially on account of hot bearings. Flashovers and grounded armatures, fields and brushholders were also common. At this time the motors were overhauled and the car wiring repaired. Whereas grease had been used as a lubricant previously oil lubrication was tried. Men were stationed at the ends of the line to oil on each trip, and the motors were also oiled nightly.

The motors then gave fairly satisfactory service until

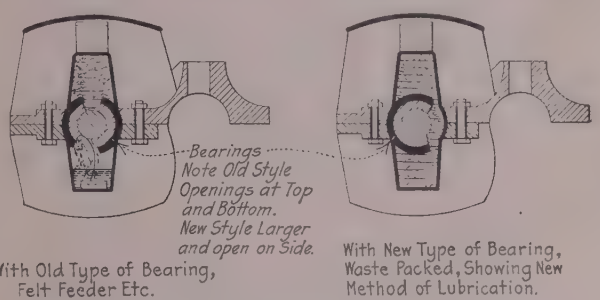
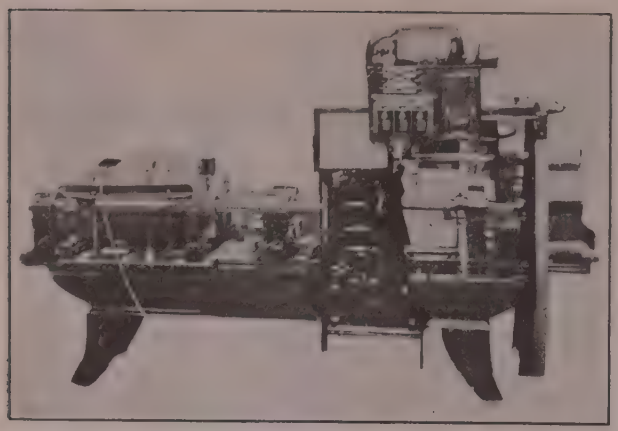

Bearings
Note Old Style Openings at Top and Bottom. New Style Larger and open on Side.
With Old Type of Bearing, Felt Feeder Etc.
With New Type of Bearing, Waste Packed, Showing New Method of Lubrication.

DIAGRAM SHOWING OLD BEARING BEFORE AND AFTER REBUILDING

about a year later, when they were placed on fast runs. Here they again developed hot bearings. An attempt was then made to convert them from the split-frame type to the box type by electric welding, using frameheads of modern motors. This was very successful, except that the cost was excessive, about $75 per motor. Finally the old bearings were rebuilt along modern lines, as described below, and this completely remedied the trouble.

In the old bearings lubrication was accomplished by means of a felt feeder, which conducted oil from the bottom of the bearing shell onto the shaft, as shown in an accompanying diagram. The glazing of this felt, together with the leakage of oil, was the cause of poor lubrication. In the new style of bearing lubrication is effected by the use of a roll of oily waste which is packed above and below the bearing, passing around the shaft, as shown in a second diagram.

In changing the bearings the first operation was to burn out the old bridging through which the felt feeder was led. A view of the shells with this piece burned out is given in an illustration on page 80. Then a



OLD PLANER USED FOR BORING BEARINGS ON REBUILT MOTORS

VIEW OF FRAME SHOWING REBORED BEARINGS

curved piece of ½-in. steel was electrically welded in place of the old bridging, as shown. This piece instead of having a hole in its center had the hole on the end, and in the upper shell a hole was left in such a position as to fit directly over this lower hole. The large bearing which fits over the wheel shaft was also built up where it had worn. Both bearings were then rebored to their original dimensions, as shown in another illustration.

For reboring, a discarded planer was pressed into service. The motor was fastened to supports which rested on the sliding bed of the planer. Both bearings were bored at the same time by two boring bars, which were geared to a motor on top of the planer. These bars were held securely and guided correctly by two heavy pillar blocks which were doweled and bolted to the frame of the planer.

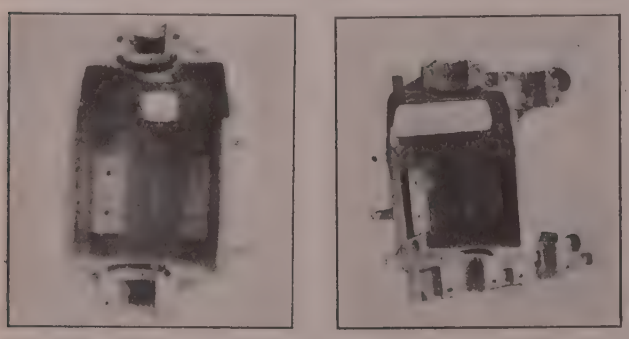
Cast-steel bearings were used in the remodeled motors on account of their long life and the ease with which they could be tinned to keep the babbitt tight. New babbitt blocks were put in, the axle lugs were reinforced and the covers were fitted with modern fastenings. The cost of the whole operation is shown below:

Welding	$6
Boring	5
Reassembling	6
Material, bearings, etc.	8
Total	$25

While this work was being done, the fields and armatures were tested and repaired. The armatures were rebanded and the commutators were tightened and slotted.

The advantages derived from this change are apparent in the following records: One car was run 280 miles per day for four days and then brought in for inspection and oiling, using 1 gill of oil for each box. The car continued in this service until it had made a mileage of 45,000, and then, for reasons other than motor trouble, it was put in lighter service. It remained in this service for 15,000 additional miles, after which the motors were still in good condition.

On another division, where the cost of lubrication had been high, after fifty out of sixty-five cars had been equipped with the remodeled motors, the cost was reduced exactly one-half. The remodeled motors are now put into the same service and given the same attention as the modern motors. The bearings do not have the life of modern ones, but where the old bearings needed overhauling after 10,000 miles, the remodeled bearings easily make 50,000 miles with oiling at regular inspection periods instead of daily.



VIEWS OF FRAME AFTER OLD BEARINGS WERE CUT AWAY AND AFTER NEW PIECES WERE WELDED IN PLACE

Prolonging the Life of Old Rail*

Experience of Connecticut Company Shows that Rail Need Not Always Be Relaid When Permanent Paving Is Installed

BY M. E. STARK

Superintendent of Track Connecticut Company, Bridgeport, Conn.

The Connecticut Company has been called upon by city and state highway officials to pave many miles of its track with so-called permanent pavement. In complying with these requests it was at first considered necessary to renew the rails which in many cases had not reached a condition where renewal would be considered necessary under ordinary conditions. It was possible in many cases, however, to prolong the life of the old rail by the use of grinding machines, special joints and welding equipment. Brief descriptions follow of methods employed in typical jobs where the track was rebuilt at the time the pavement was constructed. Figures are given to show the saving that has resulted.

Job A—The track construction on this job was 7-in., 70-lb., T-rail in 30-ft. lengths with ordinary joints. The joints were badly hammered, and corrugations had started in many places. The general surface and alignment of the track were also very poor. In rebuilding the track the joints were repaired with welding and grinding machines, Abbott joint-plates were placed under every joint, iron shims were placed under the rail on every tie and the track was paved with Hassam pavement. This job covered about 8000 ft. of double track, and by leaving the old rail in the new pavement a saving of the expenditure of nearly $20,000 was made.

Job B—This section comprised 6678 ft. of double

*Abstract of paper read at American Electric Railway Association Company Section Meeting, Dec. 14, 1916.

track and 425 ft. of single track. The rail, which was 7-in., 70-lb. section was electrically welded. New ties were installed throughout, new rails were cut in where some of the welded joints had broken down and some joints that were badly cupped were built up with the aid of the Indianapolis welding machine. The excess welding steel was ground down with the Seymour rotary grinder and finished with the reciprocating grinder, and a few places where corrugations had started were smoothed up. The track was then paved with Hassam pavement. All of the labor for track work on this line, including the preparing of the sub-grade before paving, cost 67 cents per foot of single track. The figures show that on this job alone by leaving the old rail in the new pavement a saving in the expenditure of about $16,575 was made.

Job C—This track was laid with 4¼-in. second-hand steam road rail in 30-ft. lengths, weighing about 50 lb. per yard. About half the track was located on the side and half in the center of the street. New ties, new joint plates and Abbott joints were installed and the track was back-filled with gravel. The length of single track repaired on this job was 4500 ft. and a saving in the expenditure of $3,010 was made. On a similar section comprising 3520 ft. of single track, a large portion of the old rail was left in and by prolonging the life of the old rail a saving of the expenditure of $6,325 was made.

Job D—On this job the old 7-in., 70-lb., T-rail was left in, being given the same treatment as outlined above. This covered a distance of 400 ft. of double track, the saving in this case being about $1,000.

On another job involving two tracks, one of which was in good condition, striking results were obtained. The south-bound track was of 7-in., 70-lb., T-rail somewhat cupped at the joints and with slight corrugations in places. The joints were not electrically welded. The north-bound track was of 9-in. girder rail worn beyond redemption, and this was replaced with 7-in., 95-lb., T-rail with continuous joints. When the work of putting the south-bound track in repair so as to save the old rail was under way the company put the Indianapolis welder at work and filled up all the cups at the joints, ground off the excess steel with the Seymour grinder and polished the joints down with the reciprocating grinder. All corrugations and rough places were smoothed off and now that the job is completed very few people riding over this track could say which of the two tracks rides the smoother.

It was the rule on all of these jobs that cars should not pass over the track being paved until the last section of pavement laid had been in place at least twenty-four hours, but occasionally it was necessary to let the cars run over small stretches of the track, while the pavement was being installed. In all of the jobs mentioned a good riding track has been obtained, the rail of which is embedded in a solid mass of concrete which extends 5 in. below the base of the rail. It is believed that with minor repairs with the grinding and welding machines the track will give entire satisfaction for many years to come.

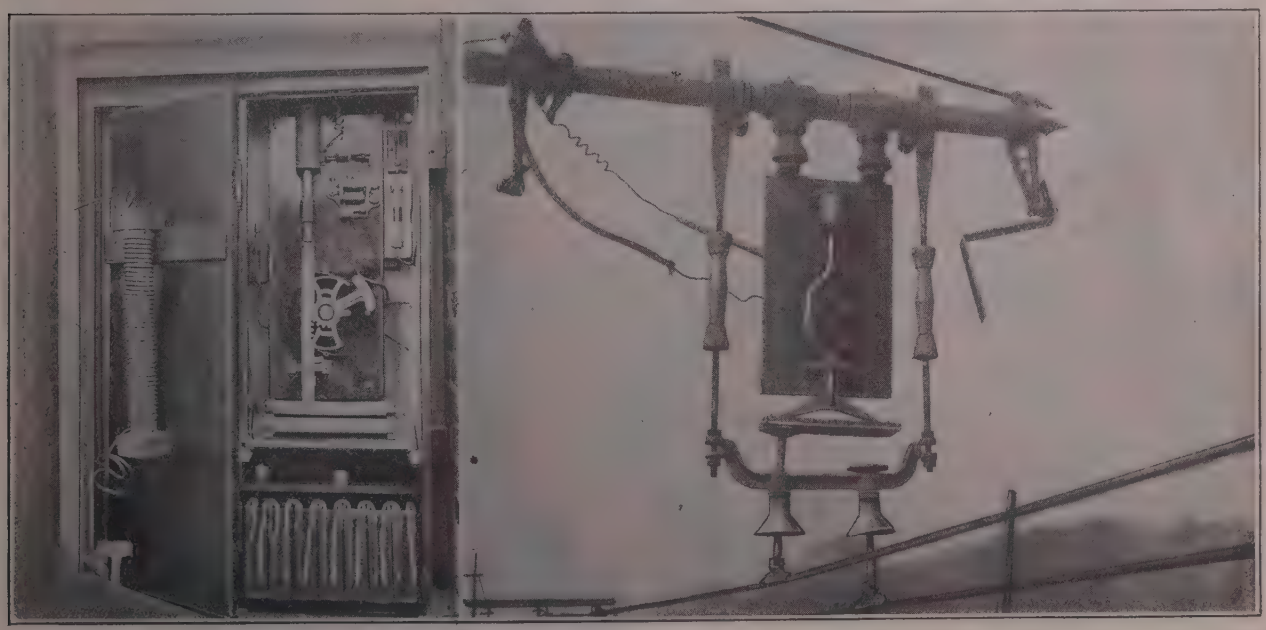
New Type of Contact Signal

A Simple Hand or Automatic Signal Operating Satisfactorily on Cleveland & Eastern

A new design of block and crossing signal has been in practical operation on the lines of the Cleveland & Eastern Traction Company for more than two years. Its construction and operation are very simple, and, therefore, no skilled workmen are required to keep it in working condition. It may be operated either from track or from trolley, a two-way switch that forms the most important element being operable either electrically by a solenoid or by mechanical pressure from the trolley poles of passing cars.

The apparatus, when operated from a rail contact for block signal purposes, consists of a switch mounted on a line pole at each end of the block, a circuit of lights connected in series between the two switches and two 30-ft. insulated sections in one rail. The circuit through the relay is completed through the other rail. The switch mechanism consists of the above mentioned relay, a solenoid which operates the switch that controls the 500-volt light circuit, and a seven-cell storage battery. This battery floats on the line continually and supplies the energy to the solenoid.

The operation of the switch is as follows: The block is protected at each end by a lantern with red lenses,



MECHANICAL TROLLEY-CONTACT SWITCH WITH HOUSING REMOVED, AND RAIL-CONTACT TYPE OF SWITCH OPERATED ELECTRICALLY

and if this lantern is illumined, indicating danger, the car is compelled to remain beyond the block until the lantern is extinguished, indicating that the block is clear.

When the signal is not set at danger, the car travels beyond the first lantern to the insulated rail, at which point the motorman receives a come-on signal by a white light. He then proceeds for about one-half the length of the block, at which point a double caution light is seen. He then proceeds through the block, and at the far end the car makes contact with another insulated length of rail, clearing all of the signals in this block for the next car or train.

The above-mentioned middle or caution light is for any irregularities, such as if another car had entered the block through the carelessness of the operator in not having observed the signal. In this case, the opposing car would immediately note that this signal was dark and would thereupon stop at once, flagging through the balance of the block.

In the operation of the same apparatus as a crossing signal, it is necessary only to use one switch with a wire running to each insulated rail. In this combination is used a set of five lights in conjunction with a bell. One each of this group of lights is located approximately 700 ft. on either side of the crossing, the remaining cluster of three lights being located at the crossing to serve as a visual indication.

The light circuit and the bell circuit are separate, so that neither one is dependent upon the other for operation. The lights located adjacent to the insulated rail on either side of the crossing are intended for the guidance of the trainmen, who are thus informed that protection is being given at the crossing by lights. Trainmen are not permitted to proceed until they get this signal, and when they are unable to get it, conductors are instructed to flag the car over the crossing. This type of signal prevents two cars from entering the crossing simultaneously—a very dangerous practice that does not give the general public sufficient time in many cases to cross between cars.

With both the block signal and the crossing signal there may be used, instead of the insulated rails, a trolley-operated switch that is entirely mechanical in operation, electric current being used only for the light signals and for the bell circuit. This contact switch is operated by the upward pressure of the trolley pole, and on a double trolley line the operation of the switch is not interfered with in any way by the trainman placing the trolley wheel on the trolley wire of either direction. The switch is used in practically the same way as the previously mentioned insulated rail sections for signal purposes, one switch being mounted on a separate pole at either end of the block.

For the crossing signal it is necessary to use one trolley contactor switch at each side of the crossing. The current to operate the bell and to illuminate the lights is taken from the trolley, the bell and lights being in series. In this case the motorman is not permitted to proceed unless he gets his proper signals through the lights, indicating that the crossing is protected by both bell and lights, the lights vibrating or giving a flash effect due to the vibration of the bell. Either of the above-described signals, which were originated and patented by Robert D. Beatty, general manager Cleveland & Eastern Traction Company, can be installed at a very nominal cost.

Aluminum wire has been used for more than 50,000 miles of transmission line of which, according to the engineers of the Aluminum Company of America, about 15,000 miles are in the Pacific States.

The Spring Type of Post Casing

A Moisture-Proof, Rattle-Proof Device Permitting Ready Removal of Sash

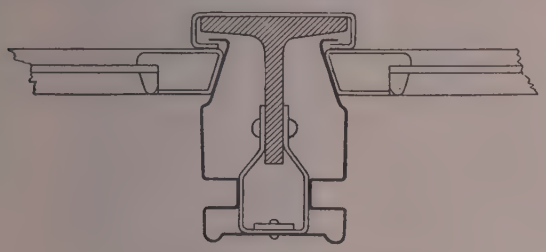
Until very recently the window system of a car built with steel upper framing was customarily made up by attaching to the T-posts grooved wooden runways for sashes and curtains, as well as the wooden pilasters. This method of construction was early discovered to be not thoroughly efficient, because the wood had a tendency to swell when subjected to dampness. The demand for a post that would not be affected by moisture eventually became so strong that the attention of The J. G. Brill Company was turned to the subject of an all-metal post, and the result has been the Brill "renitent" post, whereby there is provided a post casing that has in its favor the advantages of being water-tight, rattle-proof and safe against dropping the sash, and of being easily removed from its runways without the use of tools.

The post-casing, which gets its name from its feature of "offering elastic resistance to pressure," consists of a casing of spring brass attached to the T-post by means of clips fastened to the casing and fitting into stirrups riveted to the post. The feature of ready removal without the use of tools is of tremendous importance. Ordinarily, the removal of a sash from its casing involves careful handling of tools by a mechanic and consequently the loss of some little time. However, with the renitent post the sash may be taken from its casing simply by pulling it out. This means that the operation is one that can be performed by anyone and that does not require the services of a mechanic. However, the sash cannot be removed from its casing as a result of the casual pressure exerted by a passenger in raising or lowering. Also, no wind pressure, no matter how great, can disturb the sash.

Another very great advantage of the renitent post is

REMOVING SASH FROM SPRING-TYPE SASH GUIDER

that rattling is absolutely prevented by the elastic pressure that is exerted on the sash stiles by the spring-brass runways. This feature also guarantees the passenger against accident to his hands or arms which may be resting on the window sill and which might be injured by the sash dropping suddenly. If the catches should become unfastened the sash will drop gradually. A very great advantage given to the sash by this check on its dropping is that the sashes cannot be racked or the glass broken by careless handling. The spring brass casing gives a uniformity of pressure which does away



SPRING TYPE OF SASH GUIDE

absolutely with fitting sashes individually into their runways as must be done with sashes which are constructed to slide in wooden runways. Consequently the sashes are interchangeable from window to window and from car to car, where the windows are similar.

Still another advantage of the resilient post—and one that, although named last, by no means is the least important—is that the post casing may readily be removed from the T-post, thus making the latter easily accessible if it should be necessary to make inspections or repairs in case of collision. The clip-and-stirrup method of attaching the casing to the post is very effective although it is simple, and it absolutely prevents the casing from becoming loose.

The renitent post is considered to be better than the wooden construction not only because of its many mechanical advantages, of which the most important have been cited, but also because it presents a much better appearance than can be obtained with wood, making a lighter and considerably neater looking post than does the wooden post. This improved appearance is not the result of any sacrifice of strength, the pressed form of the post casing giving it sufficient strength in every direction to prevent it becoming dented or injured except by very heavy blows.

Because of the curving sweep which has to be given the casing, the renitent post system is not adaptable to the Brill semi-convertible type of car. However, the post may be attached to any other type of city or interurban car, and it is readily applied to the double-window post construction that is found in interurban cars built with twin windows. In this twin-post construction the gap between the post on the inside of the car is bridged with a sheet steel cover which is fastened into the curtain groove on the sash side of each of the twin posts. The renitent post is made in a range of sizes covering every width of post.

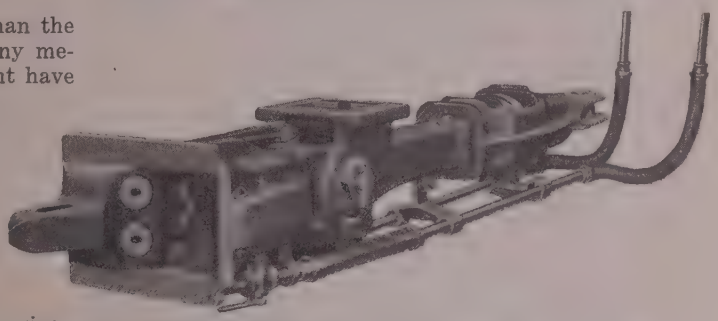
The injurious effects of skidding by electric cars were illustrated by C. V. Wood, shop foreman Newport News, & Hampton Railway, Gas & Electric Company in a paper delivered before the local company section of the American Electric Railway Association. He estimated that in sliding 10 ft. a 30-ton car develops sufficient heat to melt 0.59 lb. of metal per wheel, while a wheel carrying 20,000 lb. with a flat spot 3 in. long strikes the rail with a force of 104,000 lb. when running at 16 m.p.h.

Automatic Car and Air Coupler for City Cars

This Coupler Obviates the Necessity for Men to Stand Between Cars When Coupling

A recent design of automatic car and air couplers brought out by the Van Dorn Coupler Company, Chicago, for city and light interurban service embodies several new features. These couplers are carefully machined to make a perfectly rigid connection when coupled together, the two heads being held in this rigid contact by means of the locking mechanism, and the rigidity at the connection made possible by virtue of the suitable joints behind the heads to provide the necessary vertical and lateral movement. The horizontal movement pivots about the bolt through the inner end of the coupler, while the vertical motion is pivoted at the horizontal bolt just back of the head and unlocking lever. In spite of this exactness of fit, the couplers will properly come together and lock, it is claimed, though they may be 3 in. out of alignment, and they are sufficiently flexible to operate under conditions where the car platforms may assume a difference in level of 10 in.

A lever, located on top of the head where it is readily accessible from either side, lifts up and turns through 45 deg. to unlock the device. When in the normal position this handle lies between two lugs on the head which protect it from breakage by striking the platform or chains, and this horizontal position of the lever gives more clearance for the free working of the coupler. When operating this unlocking device, a special mechanism holds the coupler unlocked after the lever has been turned through 45 deg., the handle going back to the normal position when released. This catch on the locking mechanism is automatically released when the



AUTOMATIC CAR AND AIR COUPLER FOR CITY CARS

two couplers part, or (if the coupler has been unlocked while not in connection with another car) when they come together, so that there is no necessity for a man to stand between the cars when coupling or uncoupling. In other words, the coupler is always ready to couple up without attention being given to the locking mechanism. The lock is complete in each coupler and thus makes a double lock when two are coupled together, and as long as either one is locked the connection is held in the same rigid condition. All obstruction to the free operation of the locking lever is removed by placing the two air pipes on the underside of the coupler with the valves just behind the face plate where they are conveniently located to be reached by the trainman, both from either side. The mechanism is so designed that any wear in any part of the mechanism is automatically taken up as it develops so that the connection remains as rigid as ever throughout the life of the coupler.

The coupler heads are held in normal coupling position by a flexible supporting device underneath the

FULL DINING CAR ARRANGEMENT OF THE CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD COMBINATION PARLOR AND DINING CAR

drawbar shank, and the whole coupler is supported by means of lugs cast on the top of the shank which engage the carrier sliding on the radial bar. This flexible device supporting the head is adjustable to allow for sagging of platforms, wearing down of wheels, etc.

The Van Dorn patented draft gear especially adapted to city service is utilized with the new coupler. The slot seen in the coupling nose is for use when coupling with other style Van Dorn couplers. The length of the new couplers is 4 ft. 6 in. The pronounced rigidity of connection secured at the coupler heads of course increases the life of the couplers and insures against air leakage.

Over 200 of these couplers are in use on the cars of the Pittsburgh Railway, where the hilly conditions place rather exacting strains on coupling devices. Some 520 more of them are being made for this company which has now practically standardized on this type of equipment.

Combination Dining and Parlor Cars for Chicago, North Shore & Milwaukee Railroad

With the completion of three new all-steel cars now under construction at the Jewett Car Company's plant, the Chicago, North Shore & Milwaukee Railroad will begin a dining and parlor-car service between Chicago and Milwaukee. This is expected to be in operation soon after the first of February and its inauguration will be another link in the series of improvements and refinement of the service, roadbed and equipment of this road since it came under the control of Britton I. Budd. These new cars are to be of the standard design of the North Shore road and equipped with four motors and multiple-unit control so that they may be operated as part of a train or individually if engaged for a private party. The interior arrangement of chairs and tables is to be such that the cars may be entirely devoted to dining service or entirely to parlor-car service, or partly to both at the same time. The chairs are so dimensioned as to fit into either arrangement without the necessity to store any away. These two arrangements of the chairs are shown in the accompanying illustrations. There will be nine tables and twenty-two chairs, and stationary seats at the bulkheads for twelve passengers, making the total seating or dining capacity thirty-four persons. The kitchen is to be fully equipped to serve, as Mr. Budd says, "not elaborate meals, but everything good and at popular prices."

In the rearrangement from parlor car to diner, there is one chair extra in the smoking compartment which makes up the one short in the main compartment. Changing back, the tables all fold up and are stored in a locker at the front kitchen bulkhead. Thus after a meal is served the passengers may be made comfortable by putting the tables away and rearranging the chairs. There will probably be call for this equipment as special chartered cars for parties from the North Shore towns into Milwaukee and into Chicago, especially the latter with a station of the elevated lines in Chicago at the very door of the Auditorium theater, where all grand opera and other important social gatherings are held. The interior of the cars will be mahogany finish and the chairs solid mahogany with leather upholstery giving, with the center and side post lighting, a very attractive appearance.

An Easily-Made Phase-Rotation Meter

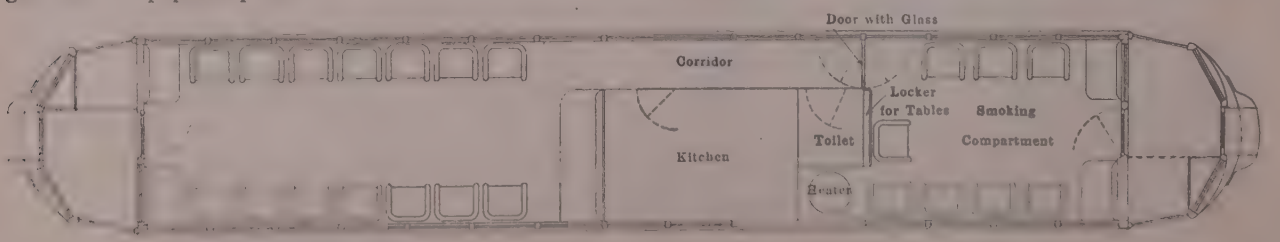
When a three-phase generator is to be connected to a live system, its phase rotation must be in the same direction as that of the system. For determining this phase rotation an easily-made instrument was devised by E. P. Peck, Georgia Railway & Power Company, Atlanta, Ga.

The instrument consists essentially of a watt-hour meter disk mounted in its bearings directly over three symmetrically spaced telephone bell coils. When this instrument is connected to a three-phase system the disk revolves in one direction or the other. The instrument is then transferred to the generator cable and if the disk revolves in the same direction as before the phase rotations are proved to be the same, and vice versa.

Oil-Insulated Cable Joints

A method of impregnating cable joints with oil has been developed by the Metropolitan Engineering Company, New York City. After a joint is made, a special sleeve having an opening for filling with oil is put on. For voltages under 16,000 the oil is simply poured through this opening.

When used on cables for voltages of more than 16,000 a special apparatus is used for producing a vacuum inside the sleeve so that when the oil is poured in it penetrates more completely than if put in under atmospheric pressure. It is claimed that the joints made by these methods operate satisfactorily under the worst conditions.

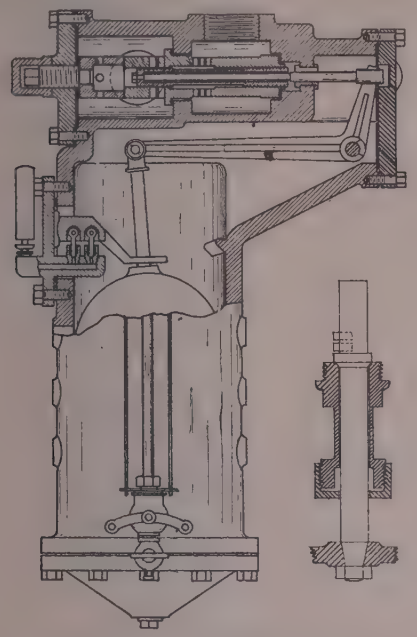


PARLOR CAR ARRANGEMENT OF THE CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD COMBINATION PARLOR AND DINING CAR

Continuous Feed-Water Regulator

A regulator for providing a continuous flow of feed water proportionate to the evaporation has been developed by the Ray Manufacturing Company, Louisville.

Essentially it consists of a perfectly balanced valve operated by a float. The feed water is admitted to the



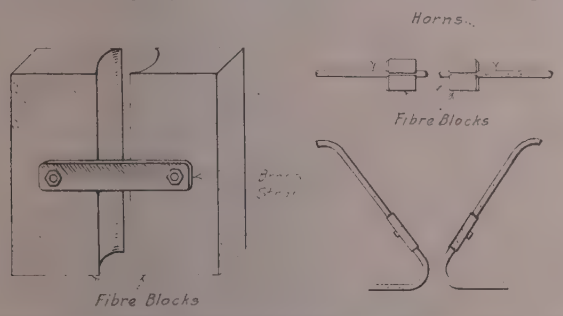
CONTINUOUS FEED-WATER REGULATOR

valve at its center and is discharged at one end in a coninous flow controlled by the position of the float.

A high and low-water alarm whistle is operated by two contact points on the float rod. The whistle lever is counter-balanced to hold the whistle valve closed when pressure is off the boiler.

Preventing Birds from Grounding Lines

Small birds have in the past been a source of considerable trouble on the lines of the Georgia Railway & Power Company. By alighting on the horn gaps of



DEVICE TO PREVENT BIRDS GROUNDING LINES AT HORN GAPS

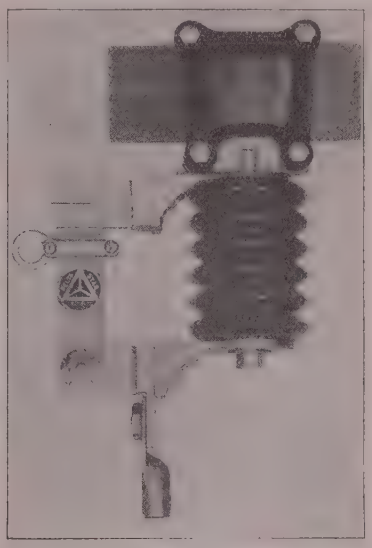
the lightning arresters they grounded the lines through their bodies and caused the automatic switches to trip out in a number of cases. To prevent such disturbances the device illustrated herewith was built under the direction of T. F. Johnson, superintendent of lines.

The device consists of two ½-in. horn-fiber blocks, 5 in. by 2½ in. each, connected together by a spring-brass strap. The heads of the bolts holding this strap are countersunk and sealing wax is poured over them. The inside edges of the blocks are grooved so as to fit on the horn. By bending back the outer edges of the blocks, the inside edges are forced apart far enough to enable them to slip over the horn. On releasing, the spring strap causes the blocks to clamp firmly on the horn. The device is placed with its bottom edge at the smallest point of the gap and with the strap on the lower side.

The only part of the gap left unprotected is above the blocks where it is so wide that no harm can be done by a bird alighting upon the horn.

Bus-Type Disconnecting Switch

A disconnecting switch which can be installed in very close quarters has been put out by the Delta-Star Electric Company, Chicago, Ill. A clamp which fits directly over the busbar serves to support the switch. Fastened to this clamp is one of the blades of the switch as shown in the accompanying illustration. A corrugated porcelain cylinder securely fastened to the clamp holds at its



DISCONNECTING SWITCH CLAMPED TO BUSBAR

lower end the hinge blade of the switch. On this end is also mounted a terminal block for connecting a circuit to the bus.

On account of its compactness this switch is well adapted for installation between a busbar and an oil switch mounted in the same bus structure. When the disconnecting switch is open the oil switch may be examined and repaired without danger. It may also be used to disconnect motor, generator and other circuits from the bus and to separate different sections of a bus.

Temporary Substation Quickly Built After Fire

Quick action in an emergency caused by the burning of a substation enabled the Hudson Valley Railway to resume normal operation just five days after the fire started. The substation was located at Wilton, N. Y., halfway between Glens Falls and Saratoga Springs, which are 20 miles apart. A temporary wooden building was constructed to house the rotary loaned by a neighboring company, the Schenectady Railway, and in the short time named above the station was put into operation and has been running satisfactorily ever since. During construction of the new building regular service was maintained by feeding the line from both ends and running light cars instead of the heavy interurban cars.

News of Electric Railways

Traffic and Transportation

Financial and Corporate | Personal Mention | Construction News

Another New Jersey Statement

President McCarter of the Public Service Corporation Reviews Recent Increases in Costs

Thomas N. McCarter, president of the Public Service Corporation of New Jersey, Newark, N. J., has issued a statement to the public dealing with a number of problems before the company. Mr. McCarter emphasizes that the corporation is confronted with rising costs in materials and labor, with an income limited by the fixed rates it can charge for transportation, gas, and electricity. He dwelt particularly upon the problems of rising material and labor costs, specifying these recent price changes:

Coal: $4 a ton paid above contract price in open market when contractors failed to make deliveries. Copper: Hard to get at 38 and 40 cents a pound, though selling at 28 cents a year ago, and in the past could be bought for 11 and 12 cents. Manganese steel, for track intersections, curves, and switches: $500 per ton, formerly $100. Other metals and metals used in car building: Increased 100 per cent. General average increase in cost of all railway materials, about 40 per cent. Mr. McCarter said in part:

"There is nothing magical about public utilities which enables them to escape the inexorable laws of trade. Every upward tendency in the price of materials and the price of labor must be met by the public utility just the same as it must be met by the merchant and the manufacturer. But there is this distinction: public-utility rates are fixed, and increases in cost of production must be absorbed by the operating company. The company's loss in this respect has been the consumer's gain. The Public Service Corporation has met extraordinary conditions during the last year and has met them without shifting any of the burdens to its patrons. Might it not be well for the public to ponder what must happen if the price of labor, the cost of materials, and the amount of taxes levied continue to mount year by year."

As the conference of committee members of the Republican majority of the 1917 Legislature has decided to put through a bill taxing gross receipts of New Jersey utility companies 5 per cent, Mr. McCarter's statement of the rising costs of utility corporations is accepted as the beginning of his campaign of protest. Mr. McCarter had frankly said that the corporation would keep representatives at Trenton just so long as legislation inimical to the corporation was introduced there, and just so long as the corporation desired the passage of what he believed to be just and reasonable measures. This course he made plain in a statement to the public republished in full in the Electric Railway Journal of Dec. 2, page 1171.

Fare Hearing in Milwaukee

Milwaukee Company in Emergency Plea Seeks to Increase Fare to Establish Eight-Hour Day and Wage Advance

The hearing before the Railroad Commission of Wisconsin on the application of the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company for a readjustment of fares and hauls to permit the company to earn enough additional revenue to establish the eight-hour basis throughout their organizations and to grant increased wages offsetting the increased cost of living was begun in Milwaukee on Jan. 5 and continued on the morning of Jan. 6. The hearing then went over until Jan. 15 at 10 a. m.

The plea of the companies was presented to the commission recently as an emergency measure. It has nothing to do with the petition for relief dated Nov. 6, 1915, and their commission has limited the scope of the emergency hearing to the single question of permitting the companies to earn enough additional revenue to give their employees the eight-hour basis and higher pay. The companies explained their case to the public through newspaper space, saying that every dollar of the increased revenue for which they were asking, if granted, would be paid to their employees. They estimate the cost of the eight-hour basis at $401,345 yearly and that of the proposed wage increase at $230,946 yearly, or a total increase of $632,791 yearly. In its petition to the commission the companies said:

"Your petitioners are desirous of placing into effect the basis of an eight-hour day throughout their entire organizations.

"To put such eight-hour day into effect and permit your petitioners' trainmen and other employees to receive as large a monthly wage as they now receive will involve an increase of approximately 25 per cent in hourly rate of pay for such trainmen and other employees, or its equivalent.

"Your petitioners also are desirous of making a further increase in wages for their trainmen and other employees in order to meet the present increase in the cost of living.

"Your petitioners are unable to put in force the basis of an eight-hour day for their trainmen and other employees, or to make this increase in wages, because of the inadequacy of your petitioners' earnings.

"The present situation of your petitioners is such as to constitute an emergency requiring relief forthwith, and immediate alteration and amendment of the rates and schedules of your petitioners' railways."

The petitioners have made the following public announcement:

"Every dollar of this increased revenue for which we are now asking if granted is to be paid to our employees.

"Our investors must wait for the relief that is due them until the commission at a later date is ready to consider all of the issue presented in our petition of Nov. 6, 1915."

Increase in Wages in Toronto

The Toronto (Ontario) Railway on Dec. 21 announced an increase in the wages of its men dating back to Nov. 1. The increase applies as follows:

Motormen and Conductors

For first year, from 23½ cents an hour to 26 cents.
For second year, from 25½ cents an hour to 28 cents.
For third year and after, from 27½ cents an hour to 30 cents.

Shedmen

Foremen, from 27½ cents an hour to 30 cents.
Operating shedmen, from 24½ cents an hour to 27 cents. Men who operate cars and do general shed work.
Shedmen, doing general shed work, but not operating cars, 26 cents an hour.
Car washers, from 23½ cents an hour to 25 cents.

Motor and Truck Repair Men

For first year, from 23½ cents an hour to 26 cents.
For second year from 25½ cents an hour to 28 cents.
For third year and after, from 27½ cents an hour to 30 cents.

Employees in other departments who have not had an increase in wages since the agreement was signed will be dealt with upon their merits. In taking this action the company has been influenced solely by the change in living conditions and the additional burdens placed upon the employees as a result of the war.

Aurora, Elgin & Chicago Arbitration

Wage Increases Awarded to City Line Trainmen, Fox River Division Trainmen and Certain Shop Employees

The arbitration proceedings between the employees of the Aurora, Elgin & Chicago Railroad and the company have been completed. The taking of testimony in the case was begun on Sept. 25, 1916. The testimony in full consisted of 3102 pages of typewritten records and 228 exhibits. The board of arbitration points out in its findings that the present day cost of living, based on information obtained generally and locally, and figured on the weights given the items composing the family living budget, by Mr. Mahon, international president of the Amalgamated Association, is 31.9 per cent higher than in 1901. It was also stated that the wages of the employees have increased between 60 per cent to 85 per cent in the same time, and thereby, that the present-day purchasing power of the wages on this road is considerably greater than in 1901.

Bion J. Arnold testified that he had made a valuation of the company's railroad property and found it to be worth in round numbers $11,400,000. He also said that the company would be entitled to earn 7 per cent on this amount, or $798,000, as a fair annual net return for railroad operation. It is not making anywhere near this amount at the present time, nor has it done so for several years.

The testimony showed that in most of its departments the company under its last agreement with the association was paying much higher wages than almost all other similar companies, and higher also than the wages paid to men in other employment in the territory served by it.

The board found that provision should be made for a minimum wage of 25 cents an hour to all power house and shop employees at Aurora, Elgin and Wheaton, employed more than one year by the company and made this award to those who have been receiving less than that amount.

In the transportation department, the award to trainmen was as follows: On the third-rail division, where the wages are fixed by the 1913 agreement at 30, 33 and 36 cents an hour, the testimony showed that nearly all the men are drawing 36 cents an hour and that some of these men earn as high as $1,400 and $1,500 a year, the average being $1,225. The board states that "it seems that they are certainly well paid and receiving all that they should reasonably receive under the facts as shown in this case."

On the Aurora and Elgin city lines and Fox River interurban lines, including the Elgin-Carpentersville, the Elgin-Aurora, and the Aurora-Yorkville interurban lines, the trainmen on regular and extra runs were granted an increase of ½ cent an hour for the first year of the contract, and 1 cent an hour for the second year of the contract, added to the 1913 agreement which was previously as follows:

	First Year	Second Year	Third Year
Aurora-Elgin	30	30	30
Aurora-Yorkville Elgin-Carpentersville	28	28	28
City Lines, Aurora and Elgin	23½	24½	26½

In its finding, the board states that it is of the opinion that the company should be entitled to earn a net annual return from the operation of its railroad property at the rate of 7 per cent after the payment of reasonable wages to the employees and all other operating expenses. Then it states that if the company makes during the present fiscal year such a net profit in its railway operation on the value of $11,400,000 set by Mr. Arnold, there should then be added to the wages of each of the employees, during the second year of the contract, 1 cent an hour.

Pay at the rate of time and one-half for overtime, Sunday and holiday work was awarded to the night shop men in Aurora and Elgin, to make their rate of pay conform with that prevailing in the other shops of the company. The finding also makes some changes in the agreement as to working conditions. The new contract between the employees and the company is made effective as though dated June 1, 1916, and continues in force for a period of two years thereafter. All wage increases are effective from June 1, 1916, and the accrued increases are accordingly allowed."

New York Commission Reports

Second District Commission Submits Tenth Annual Report to Legislature with Recommendations for Further Legislation

The tenth annual report of the Public Service Commission for the Second District of New York was submitted to the Legislature on the evening of Jan. 10. The report calls the attention of the Legislature to three changes in the powers of the commission effected by court decisions during the year which have had a far-reaching effect and which may require important legislative action. These changes include the decision of the Court of Appeals in the Ulster & Delaware Railroad's appeal, where it was held that the commission had power upon proper showing to permit an increase of the mileage book rate above 2 cents a mile, notwithstanding the "mileage book law" which restricted it to that figure. The court held that the public service commissions law of 1907 superseded all previous enactments and gave the commissions absolute power over rates.

The Court of Appeals decision in the New York and Queens gas case is also called to the attention of the Legislature. The court there held that the Appellate Division has not the power to review the reasonableness of a decision of the commissions, but only to annul the order for some violation by the commission of a rule of law. These two decisions, it is believed, give the commissions the almost absolute power over rates and service which was contemplated when the law was passed in 1907.

The courts have defined the powers of the commission under the jitney bus law and the commission has established the policy that no jitneys will be permitted to compete with existing street railways where the latter are giving reasonable service. As a result only two jitney lines are now operating exclusively within city limits in New York State outside of Greater New York. Wherever suburban lines come into cities, the certificates of convenience and necessity of the jitneys have been so drawn that they cannot carry local city passengers in competition with trolleys.

The commission calls attention to the fact that the bus lines operating outside of cities are now not subject to any control as to service, safety, rates, or their competition with existing carriers and recommends that the existing law be modified so that bus lines will not be required to file the elaborate schedule and reports required of other common carriers.

An important request for the extension of the power of the commission over the physical surroundings of grade crossings is made. In a number of cases where the expense of eliminating a grade crossing would not be warranted by the greater safety to be attained, the commission has found that the removal of brush or other obstructions to vision would make the crossing as safe as reason would require. The commission asks that it be given power to order these changes in the surroundings of grade crossings and the power to apportion the expense thereof as is now done with eliminations.

An analogous extension of power over the grade crossings of electric railways will also be asked, but as this will probably be coupled with recommendations to be contained in the report of the conference which the commission has been holding for a year with representatives of electric railways and automobile clubs throughout the State with regard to greater safety in all respects at electric railway grade crossings, specific recommendations will not be made until this conference completes its report in the near future.

The commission recommends minor changes in the law to facilitate its accounting supervision of corporations under its jurisdiction.

The report contains its usual array of statistics of interest chiefly to the operators of the utilities concerned. The accident figures show no considerable change, despite the great increase of business during the year.

The commission asks for appropriations this year of $421,000 as against $404,000 last year, and urges in the strongest terms that the Legislature repeat its appropriation for grade-crossing elimination work, as many important eliminations are now pending for which no funds are available.

United Railroads Increases Wages

First-Year Men Get 2 Cents an Hour Advance and Others 1 Cent

Just before the New Year there was posted in the carhouses of the United Railroads, San Francisco, Cal., an announcement of an increase in the wages of the platform men from President Lilienthal, in which he said: "The year 1916 has been a very hard year for the company. There has been a further very large decrease in the earnings, owing to the competition of jitneys, other automobiles and municipal lines—the cost of all materials has been largely increased—the presence of the jitney has greatly increased the number of accidents, and a reorganization of the company's finances has not yet been accomplished. But the management realizes that the cost of living has been constantly growing higher, and that it has been becoming more difficult to make ends meet, and I have been impatient to show you some practical appreciation of the admirable manner in which you are performing your duties and of the support and loyalty that you have manifested to the company. So that, while we are not even paying the interest on our bonds, I have approved an increase of wages recommended by Mr. von Phul, which he will publish in a separate bulletin."

In conjunction with this there appeared a notice from William von Phul, vice-president and general manager, to the effect that "beginning Jan. 1, 1917, the wages of platform men who have served one year or less will be increased 2 cents an hour. Wages of those who have served one year or more will be increased 1 cent an hour." The new scale of wages on this basis is as follows:

During the first six months	27 cents an hour
During the second six months	28 cents an hour
During the second year	29 cents an hour
During the third year	30 cents an hour
During the fourth year	31 cents an hour
During the fifth year	32 cents an hour
During the sixth year	33 cents an hour
During the seventh year	34 cents an hour
During the eighth year	35 cents an hour
During the ninth year and thereafter	36 cents an hour

Philadelphia Retains Ford, Bacon & Davis

Mayor Smith of Philadelphia, Pa., has retained Ford, Bacon & Davis, New York, N. Y., as expert advisers to the city, in connection with the proposed agreement between the Philadelphia Rapid Transit Company and the city regarding the contemplated high-speed elevated and subway lines. The Mayor has declared that he will see that all the conferences and meetings at which the proposed agreement is discussed are open, in order that the newspapers may keep the people informed of every move made in the matter. Ford, Bacon & Davis were retained some time ago by the then Director of Public Transit, A. Merritt Taylor, to consult with him on the so-called Taylor plan. William S. Twining was designated at that time as the expert for Ford, Bacon & Davis, and he subsequently succeeded Mr. Taylor as director.

St. Louis Settlement Conferences Postponed

Conferences with the officials of the United Railways, St. Louis, Mo., to discuss a settlement of the mill tax and franchise problems have been halted by Chairman Gregory of the public utilities committee of the Board of Aldermen. Mr. Gregory is quoted as stating that no further conferences with United Railways officials will be held until all free bridge and the Terminal Ranken tract legislation is disposed of. From present indications he is said to doubt whether these bills will be reported out in time to finish the United Railways compromise problem before the close of the aldermanic session. He recently called a meeting of the general conference committee to discuss the United Railways compromise, but called off the meeting when newspapers printed the terms of a tentative proposition Mr. Gregory's committee proposed to make to the railway in response to the company's compromise offer.

Contractors' Papers Purchased

McGraw Publishing Company Buys Two Chicago Contracting Papers

The McGraw Publishing Company, Inc., New York, N. Y., publisher of the ELECTRIC RAILWAY JOURNAL, has purchased *The Contractor* and *Contractor's Review*, both of Chicago, and will consolidate them under the name of *The Contractor*. The new paper will continue to devote itself to the interests of the contractor engaged chiefly in local work and of the contractors' superintendent. It will be published at Chicago every other week, and the subscription price will be $1 a year. The editorial and advertising policies will be directed by the staff of the *Engineering Record* with E. J. Mehren, editor of the *Engineering Record*, as editorial director and C. S. Hill as acting editor. Mr. Hill has been the editor of *Contractor's Review* and was formerly managing editor of *Engineering and Contracting* and associate editor of *Engineering News*. The other papers in addition to those mentioned which are owned by the McGraw Publishing Company, Inc., are the *Electrical World*, *Electrical Merchandising* and *Metallurgical and Chemical Engineering*.

Fire Ravages Pottsville Plant

Twenty cars, mostly of the open and service types, were burned and railway, lighting and power service was temporarily suspended by a fire on the evening of Jan. 6 which destroyed the carhouse and part of the roof of the power house of the Eastern Pennsylvania Railways at Palo Alto, Pa. According to an account of the fire related by J. H. Pardee, president of the company, to a representative of the ELECTRIC RAILWAY JOURNAL, although the turbines in the power house became flooded with water at the time, none of the generating apparatus was seriously damaged, and by 2.30 a. m. on Jan. 7 lighting service was resumed in Pottsville and a portion of the other districts served by the company. By the night of Jan. 8 electric light and power service was entirely restored. Electric railway service was largely resumed on Jan. 9 and by the following day was in practically full operation again. The total loss involved in the fire, which Mr. Pardee estimates roughly at $200,000, is fully covered by insurance. The J. G. White Management Corporation, New York, is operating manager of the property.

Underground Terminals for Cleveland

At an open meeting of the subway committee of the City Planning Commission of Cleveland, Ohio, on the evening of Jan. 4, a decided sentiment developed in favor of underground terminals for the street railways in the downtown district. Both the members of the committee and citizens who attended the meeting expressed themselves in such a way as to give an impression of opposition to the proposed underground plan for which the Cleveland Underground Rapid Transit Company holds a franchise. Fielder Sanders, street railway commissioner, expressed himself in favor of the terminal idea. Chairman Morris A. Black asked the county engineer to put into writing suggestions made at the meeting which cover the following points:

A complete survey of the traffic conditions to be alleviated by the subway terminal to be built by the city.

Preparation of a tentative contract between the city and the Cleveland Railway for the use of the subway.

Presentation to the public of exact figures showing the cost of the proposed subway system, the benefits it would bring and what the railway would have to pay for its use.

The utilities committee of the Cleveland Chamber of Commerce has for two years or more been giving this phase of railway traffic close study. Its report may be made to the chamber within a short time. It is understood that the committee does not favor the construction of the subway terminals by the city. Rather, it would have the terminals built by the Cleveland Railway under the Tayler franchise. A study of the situation at Boston is said to have convinced the members that this improvement will increase business to such an extent that the additional investment would not endanger the present rate of fare. The committee does not favor building long underground lines.

Trial of Strike Damage Case

After a series of prolonged delays the trial of the action brought against the County of Erie by the International Railway, Buffalo, N. Y., in an effort to recover $108,410 damages for property alleged to have been destroyed during the street railway strike riots in the spring of 1913, was started before Justice Louis W. Marcus in the Supreme Court of Erie County on Jan. 6. After obtaining a jury, Thomas A. Sullivan, former county attorney, who appears for the defense, argued for the dismissal of the complaint. He contended that the entire county could not be held responsible for damage done to the company's property within the city of Buffalo. The court must render a decision on this point before the witnesses testify.

James O. Moore, of Norton, Penney, Spring & Moore, of counsel for the International Railway, opposed the dismissal of the suit. He reviewed briefly the efforts of the city and later the county to stop the riots and damage to the company's property. He said the city police were unable to stop the riots and hundreds of extra police were sworn in by Michael Regan, who was then chief of police. As the city was unable to restore order, the International Railway appealed to the county authorities, according to Mr. Moore, and when this agency was unable to handle the situation, Mr. Moore argued that on the company's application two regiments of the New York National Guard were pressed into strike and riot duty. In continuing his argument against the dismissal of the complaint against the county, Mr. Moore declared that the county should be required to defend the action as the county sheriff has greater authority in handling strike riots than the city police department. A similar action is pending against the city of Buffalo and Mr. Moore argued that the city and county should be held jointly responsible for damage to the company's property because of the failure of the city and county authorities to afford adequate protection.

Scores of witnesses have been subpoenaed by the International Railway in its efforts to prove every item of damage listed in its complaint and bill of particulars which was demanded by the county. Almost a score of newspaper men who were assigned to "cover" the strike, including the Buffalo correspondent of the ELECTRIC RAILWAY JOURNAL, have been subpoenaed to tell of specific acts of rioters who broke car windows, intimidated loyal employees and caused other damage to the company's property in all sections of the city. In some instances members of the National Guard who were called to do strike duty are accused by witnesses of having aided in destroying the company's property.

Old Street Railway Ordered Removed.—The City Commission of San Angelo, Tex., has ordered the rails and ties of the old San Angelo Street Railway removed from the city streets. The tracks are the property of J. D. Suggs, who operated the system for several years. The city recently granted a franchise to the Interstate Electric Corporation, New York, which will install and operate a street railway system here. Mr. Suggs about a year ago offered to present the old railway to the city.

Municipal Power Sales to Street Railways.—When Massachusetts cities and towns were first authorized to engage in the manufacture or distribution and sale of electricity in 1891, they were excluded from supplying it for the operation of electric cars. In its annual recommendations for legislation just filed with the General Court, the Gas & Electric Light Commission states that any justification for this restriction has long since ceased to exist and recommends authorizing municipal plants to distribute and sell electricity for this purpose if they see fit.

Louisville Veteran Dead.—Patrick J. Lally, Louisville, Ky., after nearly forty years' service in the employ of the Louisville Railway, is dead of pneumonia at his home in Louisville. Inspectors and old employees of the company were his pallbearers. "Pat" Lally began as driver, lasting one day, after which he was put in charge of the old transfer station. He had been for many years an inspector and was known personally to thousands. His popularity was attested by the fact that he was chosen in a newspaper popularity contest to make a trip covering the East.

Experiment with New Car Gate in New York.—At a hearing on Jan. 8 before the Public Service Commission for the First District of New York, George Keegan, assistant to Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, agreed that the company install for trial types of folding platform gates on the Third Avenue elevated line, similar to those in use now in Brooklyn. The cost, Mr. Keegan said, would be about $75 a car, and upon his statement the case before the commission, dealing with the question of a new type of gate, was closed pending the result of the trial. The company will experiment with several types of gates on the two trains.

Illinois Jitney Men Lose.—The jitney bus men of Rock Island and Moline, Ill., have lost the first round in court in the injunction sought by the Public Utilities Commission to restrain them from operating until certificates of convenience and necessity are secured. Judge Ramsey overruled a motion for rule upon Attorney-General Lacey and C. J. Searle, attorney for the Tri-City Railway, to show cause why they should not be permitted to maintain the action. The court held, however, that the demurrer filed by the jitney bus men against the injunction petition was proper and it is upon this manner that the petition itself will be argued to the court.

Bonuses in Indianapolis.—The Indianapolis Traction & Terminal Company, Indianapolis, Ind., has paid bonuses to 500 conductors and motormen, ranging from $30.33 to small amounts. This is in keeping with the announcement made by the company last July that a sum would be paid equal to what the men would have received had the increased wage scale gone into effect on July 8. The company announced in July that the new wage scale would go into effect on Jan. 1 and that bonuses would be paid to compensate the men for that time from July to January. From Jan. 1 conductors will receive 22 cents an hour for the first year of service to 30 cents an hour for men who have been in the service for seven years or more.

Final Hearings Soon on Riverside Plans.—Although opposition to the city's plan for improving Riverside Drive, New York City, and relocating the tracks of the New York Central Railroad along the west side has increased steadily since the plans were made public nearly a year ago, indications are that the Board of Estimate will approve the proposal and that the work will proceed within the next few months. Mayor Mitchel and Controller Prendergast were responsible for the original plans. Final public hearings will be held before the Board of Estimate within a week or two and then the board will act upon the proposed contract with the New York Central Railroad. This contract will include a provision for the electrification of the line.

Increase in Wages in Oklahoma City.—On Jan. 1, 1917, the Oklahoma Railway, Oklahoma City, Okla., voluntarily made the following raise in wages to conductors and motormen: First year, from 20 cents an hour to 21 cents an hour; second year, from 22 cents an hour to 23 cents an hour; third year, from 24 cents an hour to 25 cents an hour; fourth year, from 25 cents an hour to 27 cents an hour; fifth year, from 26 cents an hour to 28 cents an hour; sixth year, from 27 cents an hour to 29 cents an hour; seventh year, from 28 cents an hour to 30 cents an hour; eighth year, from 29 cents an hour to 31 cents an hour; ninth year, from 30 cents an hour to 32 cents an hour. The new rates cover both the city and the interurban lines.

Compulsory Strike Investigation Plan Proposed.—On Jan. 6, Chairman Adamson of the committee on interstate and foreign commerce of the House of Representatives introduced the administration's railroad legislation bill providing for compulsory investigation of labor disputes. The bill proposes a special board of inquiry to ascertain the facts in each case and to report as soon as possible with recommendations for a settlement, in no event later than three months from the reference of the controversy to it, all strikes being prohibited during the period of investigation. The bill also provides that the President shall have power to take possession of the railroads in emergencies. The Adamson bill is the same as the Newlands bills now pending in the Senate, except that the former also prescribes an eight-hour day for all railroad employees in interstate commerce.

Central Brooklyn's Transit Problem.—The Public Service Commission for the First District of New York, through Chairman Oscar S. Straus, has submitted to T. S. Williams, president of the New York Municipal Railway Corporation of Brooklyn, the exact position of the Public Service Commission with respect to the solution of the transit problem of Central Brooklyn, including the proposed completion of the third-tracking of the Fulton Street line. This letter followed one from President Williams in which he stated the willingness of the company to agree to certain changes in the plans already formulated for Brooklyn, but to which were added a number of additional conditions to which the commission has declined to agree. The commission informed President Williams, and through him the Brooklyn company, that in the event that it prefers litigation to cooperation the commission, while it would regret such an alternative, is ready to face it.

Injunction Sought in Illinois Traction 5-Cent Fare Case.—City Counselor Daues, of St. Louis, Mo., on Dec. 28, applied for an injunction in the United States District Court to restrain the Illinois Traction Company from increasing the passenger fare between St. Louis and Granite City, Ill., from 5 to 10 cents on Jan. 1. The increase was authorized by the Interstate Commerce Commission. A bill is pending in the Board of Aldermen of St. Louis to repeal the franchise of the company because the rate increase violates a provision in it limiting the fare to and from the tri-cities to 5 cents for adults. The Aldermen refused to direct that an injunction suit be filed by the counselor on the ground that such a suit would conflict with the proposal to repeal the franchise. The United States, the Interstate Commerce Commission and the Illinois Traction Company are named as respondents in the injunction proceedings. Under the law such suits must be tried before at least three federal judges, one of whom shall be a member of the Court of Appeals.

Plans for Large Car Storage Yard.—The Public Service Commission for the First District of New York is negotiating with the city authorities with a view to utilizing a part of the westerly portion of the Jerome Avenue reservoir tract for a storage yard for subway cars in connection with the operation of the Jerome Avenue extension of the Lexington Avenue subway. The westerly portion of the reservoir tract adjoining Jerome Avenue has never been improved by the city. Commission, city and railroad company engineers are studying the tract with a view to determining what portion of it could best be utilized for the purposes desired with the least detriment to other property in the neighborhood. If the city decides to take a sufficient amount of this tract to provide a storage yard for 250 subway cars, it will be possible for the city to make available for other uses a certain sum equivalent to the value of the property taken from rapid transit funds and it will not be necessary to exempt from taxation other property upon which taxes are now paid.

Programs of Association Meetings

Massachusetts Street Railway Association

The regular monthly meeting of the Massachusetts Street Railway Association has been postponed to Jan. 17, at Young's Hotel, Boston, when Joseph C. Pelletier, District Attorney of Suffolk County, will speak on "The Life About Us."

Illinois Electric Railway Association

The annual meeting of the Illinois Electric Railway Association will be held at the La Salle Hotel, Chicago, Ill., on Jan. 19. An interesting program has been arranged to include an exhibition of the moving-picture film, "The King of the Rails," showing the construction of the electric locomotives and the electrification of the Chicago, Milwaukee & St. Paul Railroad. A paper by G. M. Woods, of the Westinghouse Electric & Manufacturing Company, on "The Effect of Low Voltage on Railway Motors," will be read. K. W. Mackall, electrical engineer of the Ohio Brass Company, will read a paper on "Headlights," and M. J. Feron, general superintendent of transportation, Chicago Elevated Lines, will present a paper on "How Trainmen Are Developed into Motormen."

Financial and Corporate

Capital Stock Tax Rulings

Tax Based on Average Value of Stock—Payment Due in Advance for Privilege of Doing Business—Holding Companies Subject to Tax

In an opinion just made public the United States Commissioner of Internal Revenue has made specific rulings on questions that have been raised in connection with the special excise tax of 50 cents for each $1,000 of fair value of the capital stock of corporations, this tax being due as of Jan. 1, 1917, and having an exemption limit of $99,000. It is held that the new tax is a tax on the privilege of doing business similar to occupational taxes on individuals, that it is to be measured by the average value of capital stock during the preceding year and is to be paid in advance like other privilege taxes.

To give the opinion more in detail, it is stated that where the capital stock of a corporation is worth $100 per share, par value, and the corporation reports 10,000 shares, having a total value of $1,000,000, and also reports a surplus of $500,000 and undivided profits of $50,000, the book value of such stock would be $1,550,000. This should be taken as the basis of the approximate value of the stock per share ($155), unless by reason of earning capacity the real value is in excess of the book value, or unless for any reason the book value is fictitious and is shown by overestimating the value of assets.

If the "average profits per share earned during the preceding five years" indicate an "estimated earnings capacity" in excess of the book value, the fair value of the capital stock may be based upon a reasonable return on capital invested, dependent on the hazards of the business and on the prices which the stock of corporations engaged in a similar character of business brings in the open market. If the book value is fictitious and is shown by overestimating the capital assets, this fact should be fully explained and may be given allowance in determining the fair value of stock.

In regard to holding companies, it is said that where such a company owns all the stock of several subsidiary corporations which is not listed on any exchange or which has not been sold in the last fiscal year, the fair value of the stock of such subsidiary companies may be estimated from the market value of the total capital stock of the holding company (the parent corporation) by apportionment of the fair value of the total capital stock of the holding corporation among the subsidiary companies. This, however, does not relieve the holding company from its liability to the special excise tax.

Corporations estimating the fair value of their stock should comply strictly with the provisions in the regulations by taking "the average price at which sales were made during the preceding fiscal year" and not the average selling price per share. Thus, if ten shares were sold at $100, and 1000 shares were sold at $70, the average price at which sales were made would be $85. The average selling price in such a case would be $70.29, but this price will not be accepted as an average fair value. Corporations protesting against this method may file a statement of facts for the Washington office.

The new tax, it is stated, is an excise tax on the privilege of doing business. Being a privilege or occupational tax, it is payable in advance for a period from the time the act goes into effect to the end of the fiscal year and annually thereafter in July, the beginning of the government's fiscal year. The tax is payable to the collector at any time after Jan. 1, 1917, but penalties for nonpayment do not attach until ten days after notice and demand therefor has been served by the collector upon the taxpayer. It is a condition precedent that a corporation to be liable to the tax must have been engaged in business some time during the preceding taxable (fiscal) year.

Annual Report

Seattle Municipal Street Railway

The statement of income of the Seattle (Wash.) Municipal Street Railway for the year ended Nov. 30, 1916, follows:

Passenger revenue	$33,651
Freight revenue	9,139
Miscellaneous revenue	2,785
Total revenues	$45,575
Way and structures	$6,530
Equipment	2,330
Power	12,946
Passenger conductors and motormen	18,993
Freight conductors and motormen	2,622
Car house employees	4,949
Other transportation employees	750
Other transportation expense	981
Traffic	....
General and miscellaneous	5,886
Total expenses	$55,988
Operating deficit	$10,413
Interest on bonds	19,125
Total deficit	$29,537

The total revenues during 1916 showed an increase of $9,160 or 25 per cent over those of the preceding year, and the operating expenses fell off $4,084 or about 7 per cent. The passenger total in the last year was 699,430 and the number of car miles run 317,345 for passengers and 12,750 for freight. On Division "A" the passenger revenues per car mile in 1916 were 12.13 cents and the expenses 14.49 cents, as compared to 11 cents and 19.02 cents in the preceding year, while on Division "C" the passenger revenues were 10.81 cents and the expenses 19.18 cents, as compared to 10.07 cents and 18.03 cents in 1915, and the freight revenues were 71.68 cents and the expenses 20.57 cents as compared to 47.15 cents and 20.51 cents the year before.

According to the annual report of the department of public utilities of the city of Seattle for the year ended Nov. 30, 1916, from which the foregoing statement is taken, the passenger business on Division "C" did not increase during the last year; in fact, the Sunday travel dropped off considerably. The unusually cold and backward summer had a good deal to do with it, but the increased number of automobiles had a marked effect upon the revenue of the line. Division "C," however, prospered more than Division "A," owing to an increase in freight business. Paving material for the Seattle-Des Moines highway was hauled over the company's lines from May until September and increased the revenue by $3,000. Another big factor in increasing freight revenue was a log-hauling contract which was begun in July and will continue probably until spring. The revenue derived from this source will probably be between $5,000 and $6,000.

According to Superintendent A. L. Valentine, the receipts of Division "C" for the last year were greater than ever before, and a profit was shown for several months, but this is only a temporary improvement depending upon an unusually large amount of freight business. To attain a stable and profitable revenue for this line, the territory served must become more thickly populated. With the enormous increase in industrial activity now centering around the east and west waterways, it is said that the Lake Burien territory should build up accordingly, but it will not get its full share until the car line has been run into the city.

Relief for the Boston Elevated

Partial relief, at least, for the Boston (Mass.) Elevated Railway, is forecasted by an informal vote of the special investigating commission at a meeting during the week ended Jan. 6 in anticipation of a report due soon for presentation to the 1917 Massachusetts Legislature. The board is known to favor returning to the company the $500,000 guarantee deposited with the State twenty years ago to insure the property damages accruing from the building of the elevated lines in Boston. The commission agrees with the company that the necessity for this deposit has passed. The board also favors the public ownership of the Cambridge subway, but will probably leave to the Legislature the question whether it is to be purchased by the State or by the city. Inclosed transfer areas are also favored by the commission with no specification as to their locations. These are to be left to the discretion of the company, subject to the approval of the Massachusetts Public Service Commission or the Boston Transit Commission, as the Legislature may determine. The report will probably include discussions of increased rate of fare and reduced taxation, but the views of the commission upon these topics are not available at this writing except that the likelihood of fare unit increase recommendations may be considered doubtful at this time.

The Boston Chamber of Commerce is now considering a report of its public utilities committee on the company's financial situation, among the signers being Russell Robb of the firm of Stone & Webster, John E. Oldham of Merrill, Oldham & Company, and also Hammond V. Hayes, a rate and engineering expert of the New England Telephone & Telegraph Company, Boston. This report favors relief which will increase the net revenue of the company; advocates an increase in fare if no other adequate relief can be obtained; holds that the purchase of the Cambridge subway by the State may be helpful but does not meet the basic need of the system; opposes city or state contributions; favors the elimination of certain paving burdens and the inclosing of transfer areas or reduction of certain free transfer facilities. The report points out that when the city or state contributes toward the expense there is no automatic rectifying force, the contribution being general and quickly forgotten, while a contribution in the form of fares is personal, and automatically creates an interested and watchful body of critics, between whom and the company the Public Service Commission must sit in judgment.

San Francisco Deposit Time Extended

Two Committees, One Eastern, the Other Western, Seek Deposit of United Railroad's 4 Per Cent Bonds

The committee of bankers of San Francisco, Cal., which has put forth a reorganization plan for the United Railroads of San Francisco, has issued a circular to holders of the 4 per cent bonds stating that up to Jan. 1 there had been deposited with the committee $9,500,000 of the bonds from 900 bondholders. The committee has extended the time for deposit of the bonds to Jan. 31 and announces that unless a majority of the 4 per cent bonds has been deposited by that date the committee will feel compelled to abandon the plan, return the deposited bonds and retire from further connection with the re-organization of the company.

Meanwhile a new committee composed of Baltimore, Philadelphia and New York men has been formed and is asking for deposit of the bonds in opposition to the San Francisco plan. This committee is headed by John Henry Hammond of Brown Brothers & Company, New York, as chairman. Other members of the committee are Donald G. Geddes, of Clark, Dodge & Company, New York; B. Howell Griswold, Jr., of Alexander Brown & Sons, Baltimore; A. H. S. Post of the Mercantile Trust & Deposit Company, Baltimore, and Edward B. Smith of Edward B. Smith & Company, Philadelphia.

The San Francisco committee states that it is convinced that, under existing conditions, a more favorable plan for the bondholders cannot be made, and that if its plan be abandoned, foreclosure suit will follow and the bondholders will be compelled to contend for their rights in the courts. It calls attention to the foreclosure proceedings brought on the $1,800,000 of Market Street Cable Railway 6 per cent bonds and says that immediate action by the holders of the 4 per cent bonds is imperative. The committee asserts that it is willing to do all in its power to help get the company out of its difficulties, but unless a majority of the 4 per cent bonds is deposited by Jan. 31, it will give up its plan as it will be unable to proceed further.

Brooklyn (N. Y.) City Railroad.—At the annual meeting of the board of directors of the Brooklyn City Railroad, on Jan. 9, Frank Lyman was re-elected president of the company and Z. E. Watson was re-elected secretary and treas-

urer. Henry F. Noyes was elected vice-president to succeed Richard L. Edwards, who had been vice-president of the company since Jan. 14, 1908. The Brooklyn City Railroad is operated under lease by the Brooklyn Rapid Transit Company.

Detroit (Mich.) United Railway.—As noted in the ELECTRIC RAILWAY JOURNAL for Dec. 30, 1916, page 1365, the stockholders of the Detroit United Railway will take action at the annual meeting on Feb. 6 on the recommendations of the board of directors to increase the capital stock of the company from $12,500,000, all outstanding, to $25,000,000, to provide from time to time for funds necessary for the acquisition and construction of additional lines of railway, the purchase of rights-of-way, equipment, etc., for the growth and development of the property. In a supplementary notice to the stockholders F. W. Brooks, president of the company, announces that with the authorization of the additional issue the management will recommend that during 1917 there shall be issued $2,500,000 of the new stock for the purposes mentioned and that stockholders shall receive the right to purchase the same at par in proportion to their holdings of the present stock.

Bloomington & Normal Railway & Light Company, Bloomington, Ill.—The Bloomington & Narmal Railway & Light Company, controlled by the Illinois Traction Company, has filed at Springfield notice certifying to an increase in the capital stock of the company from $1,650,000 to $1,900,000. The company is reported unofficially to have $1,200,000 of common stock and $450,000 of 6 per cent cumulative preferred stock outstanding at present.

El Paso (Tex.) Electric Railway.—The El Paso Electric Railway has filed an amendment to its charter at Austin increasing its capital stock from $2,500,000 to $3,500,000. The proceeds of the $1,000,000 of additional capital will be used for additions and betterments.

Georgia Railway & Power Company, Atlanta, Ga.—Payment of accumulated dividends at 6 per cent for the years 1913, 1914, 1915 and 1916, or 24 per cent total, on the company's first preferred cumulative 6 per cent stock issue of $2,000,000 was authorized on Dec. 28 by the directors of the Georgia Railway & Power Company. This payment was ordered to be made to all stockholders as of record at the close of business on Jan. 5, as follows: $60,000 in cash on Jan. 15, and $420,000 in company non-interest bearing scrip to be delivered also on that date and to be payable $30,000 semi-annually for the ensuing seven years, beginning on July 1, 1917. The issuance of the scrip is subject to the approval of the Georgia Railroad Commission, which has been petitioned formally for that approval and will hear the petition on Jan. 11. A statement issued by the company with the announcement of this action invited attention to the fact that following the payment on Jan. 1, 1913, of the 6 per cent preferred dividend accrued at that date in the several months since the company's organization, heavy demands were made upon the company for the expenses of construction and other new work in the development of its water-power properties. All earnings were diverted to meet those demands, which ceased some months ago when the company completed the building of its foundations. It is regarded as probable that the cumulative dividends on this first preferred stock will be paid hereafter by the company annually as they fall due. Application for authority to issue $283,000 par value of refunding and improvement forty-five 5 per cent bonds has been filed with the Georgia Railroad Commission by the Georgia Railway & Electric Company. The petition will be heard on Jan. 11. The bonds are to cover additions and improvements made during 1916. The Georgia Railway & Power Company has petitioned the Railroad Commission for authority to issue $459,000 par value of first and refunding mortgage bonds to reimburse the treasury for cash advanced for the acquisition and improvement of new properties. The commission will hear the matter on Jan. 11.

Kansas City (Mo.) Railways.—The Kansas City Railways has bought in the Kansas City Elevated Railway for $260,000 and the Kansas City & Westport Belt Railway for $100,000. They were auctioned off from the court house steps by Rush C. Lake, one of the federal court commissioners in the settlement of the receivership of the Metropolitan Street Railway, the predecessor of the Kansas City Railways. The sale is a mere form resulting from the receivership.

Kentucky Securities Corporation, Lexington, Ky.—An extra dividend of 1 per cent has been declared on the $2,154,920 of preferred stock of the Kentucky Securities Corporation on account of accumulations, along with the regular quarterly 1½ per cent, both payable on Jan. 15. This disposes of all the accumulated dividends on this issue.

Minster & Loramie Railway, Ft. Loramie, Ohio. — The First National Bank, New Bremen, Ohio, has filed an action in Common Pleas Court asking that a receiver be appointed for the Minster & Loramie Railway. The action states that in the October term of court in 1916, the plaintiff received a judgment for $1,083, which has not been paid. The bank is the owner of bonds of the railway of a total par value of $20,000, constituting the entire bonded indebtedness of the company. These bonds are dated July 1, 1914, and are secured by a first mortgage. The bank says that the railroad is in default of the payment of interest on the bonds since July 1, 1915. The bank also owns eighty-seven shares of stock of a par value of $100 each.

New York State Railways, Syracuse, N. Y.—The directors of the New York State Railways have reduced the common stock dividend from 1¼ per cent to 1 per cent quarterly. Last April the dividend was increased from 1 per cent quarterly to 1¼ per cent.

Norton, Taunton & Attleboro Street Railway, Norton, Mass.—The Massachusetts Public Service Commission has authorized the Norton, Taunton & Attleboro Street Railway, the successor to the Norton & Taunton Street Railway, to issue $120,000 of capital stock.

Omaha, Lincoln & Beatrice Interurban Railroad, Lincoln, Neb.—The Omaha, Lincoln & Beatrice Interurban Railroad has been authorized by the Nebraska Railroad Commission to issue $2,000,000 of common stock and $500,000 of preferred stock and $2,500,000 of bonds for building and completing its line from Omaha to Lincoln.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—The San Francisco-Oakland Terminal Railways has issued a statement concerning the arrangement with local banks under which they have agreed to purchase the coupons due in January and in default. The company said: "This company was unable to pay, on their due date, coupons of the San Francisco-Oakland and San José Consolidated Railway, maturing Nov. 19, 1916, and will likewise be unable to pay, on their due dates, the various coupons maturing during the month of January, 1917. Actuated by a desire to preserve the status of the company's securities, pending the outcome of efforts to bring about a franchise resettlement, certain San Francisco and Oakland banks have again offered, as a matter of accommodation to bondholders desiring to cash their coupons at the respective due dates, to purchase these coupons at the full face amount thereof, less income tax, provided they are accompanied by a bill of sale similar to that used last July, such bill of sale being necessary, in the opinion of the attorneys for the purchasing banks, to protect moneys advanced by them. The banks joining in this advance consist of the Anglo & London Paris National Bank, the German Savings & Loan Society, Mercantile National Bank of San Francisco, Savings Union Bank & Trust Company, Central National Bank, Oakland; the Oakland Bank of Savings and the First National Bank, Oakland."

Scranton (Pa.) Railway.—The American Railways has elected to purchase at 102½ and interest on March 1 all of the outstanding $1,500,000 of 5 per cent preferred stock gold trust certificates of the Scranton Railway due in 1935.

Sherbrooke Railway & Power Company, Sherbrooke, Quebec.—The Southern Canada Power Company, Ltd., Drummonsville, Quebec, has offered to take over 51 per cent of the capital stock of the Sherbrooke Railway & Power Company, proposing to increase its own capital stock and create a 6 per cent preference stock, cumulative from Jan. 1, 1920. One share of this preference stock will be given in exchange for four shares of the capital stock of the Sherbrooke Railway & Power Company. If this is acceptable to the shareholders control will be transferred immediately. It is reported that shareholders holding about

one-fourth of the capital stock of the Sherbrooke Railway & Power Company have signified their intention of accepting the offer.

Springfield Terminal Railway & Power Company, Springfield, Ohio.—Warner & Fitzharris, Philadelphia, Pa., are offering with C. W. Anderson & Company, Chicago, Ill., $250,000 of first mortgage 6 per cent serial gold bonds of the Springfield Terminal Railway & Power Company, the successor to the Springfield, Troy & Piqua Railway. The proceeds of the bonds will be used to fund floating indebtedness. They will be the new company's only indebtedness. The total authorized issue is $350,000. The bonds are dated Dec. 1, 1916, and mature serially, the last maturities ($50,000) being in 1926. The remaining bonds can be issued only for betterments and additions to the extent of 85 per cent of their cost.

Dividends Declared

Central Illinois Public Service Company, Mattoon, Ill., quarterly, 1½ per cent, preferred.

Chicago (Ill.) Railways, 2 per cent, participating certificates, series 2.

Kentucky Securities Corporation, Lexington, Ky., quarterly, 1½ per cent, preferred; 1 per cent preferred on account of accumulated dividends.

New England Investment & Security Company, Springfield, Mass., 2 per cent, preferred.

Ottumwa Railway & Light Company, Ottumwa, Iowa, quarterly, 1¾ per cent, preferred.

Pacific Gas & Electric Company, Sacramento, Cal., quarterly, 1½ per cent, common.

Puget Sound Traction, Light & Power Company, Seattle, Wash., quarterly, 75 cents, preferred.

United Railways & Electric Company, Baltimore, Md., quarterly, 50 cents, common.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period			Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Nov.,	'16	$73,298	*$41,330	$31,968	$18,408	$13,560
1 "	"	'15	65,711	*33,353	32,358	17,624	14,734
12 "	"	'16	823,553	*453,550	370,003	213,869	156,134
12 "	"	'15	787,035	*395,785	391,250	212,351	178,899

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

1m.,	Nov.,	'16	$80,136	*$72,091	$8,045	$27 550	††$19.277
1 "	"	'15	72,855	*62,253	10,602	16,786	††5 956
5 "	"	'16	454,186	*369,025	85,161	138,456	††52.343
5 "	"	'15	425,640	*321,885	103,755	84,526	††20,059

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO

1m.,	Nov.,	'16	$35,957	*$21,316	$14 641	$11,649	$2,992
1 "	"	'15	33.940	*16,844	17,096	11,096	6,000
11 "	"	'16	426,104	*241,786	184,318	125,691	58,627
11 "	"	'15	392,346	*211,860	180,486	120,938	59,548

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

1m.,	Nov.,	'16	$316,468	*$184,587	$131,881	$42,862	$89,019
1 "	"	'15	277 008	*154,959	122,049	41,197	80.852
12 "	"	'16	3.500,760	*2,069.138	1,431,622	513,997	917.625
12 "	"	'15	3,091,422	*1,833,337	1,258,085	475,142	782,943

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m.,	Nov.,	'16	$1,510,666	*$860,290	$650 376	$426,081	$224,295
1 "	"	'15	1,323.673	*674,794	648,879	403,980	244,899
12 "	"	'16	16,705,218	*9,064,088	7 641,130	5,020,444	2,620,686
12 "	"	'15	14,317,036	*7,599,095	6,717,941	4,428,639	2,289,302

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m.,	Nov.,	'16	$450,652	*$346,949	$103,703	$119.161	††$14.499
1 "	"	'15	417,448	*332,972	84.476	120,461	††34,387
5 "	"	'16	2,601,745	*1,815,365	786 380	601,994	‡217.628
5 "	"	'15	2,315,598	*1,696,815	618,783	602,135	‡49,925

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m.,	Nov.,	'16	$479 367	*$242,563	$236,804	$182,115	$54,689
1 "	"	'15	455,165	*250,683	204,482	182,363	22,119
12 "	"	'16	5,453,455	*3,035,833	2,417,622	2,177,998	239 624
12 "	"	'15	5,542,900	*3,073,832	2,469,068	2,208,504	260,564

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

1m.,	Nov.,	'16	$14,063	*$17,211	$3,148	$$2,018	††5,138
1 "	"	'15	19,847	*21,425	1,578	$1,723	††3,271
5 "	"	'16	92,436	*98 772	6,336	$9,455	††15,657
5 "	"	'15	116,228	*109,218	7,010	$8,116	††957

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Ruling in Toilet Case

Pennsylvania Commission Decides That No General Order Be Issued—Specific Complaint Dismissed

The Public Service Commission of Pennsylvania at Harrisburg, Pa., on Jan. 8 handed down a decision in which it is declared that no general order should be made requiring the placing of toilet facilities in the cars of interurban lines. Several months ago the commission called a special conference of the representatives of the electric railways of Pennsylvania at Harrisburg to consider the question of whether a general order or special regulations affecting special cases should be issued. The general opinion of the officers of the railways was that a general order would work a great hardship upon all interurban railways since no two companies operated under exactly the same conditions. In the opinion of the Public Service Commission of Pennsylvania this viewpoint is upheld.

The case upon which the ruling is made is that of James M. Maurer, Reading, against the Oley Valley Railway. Mr. Maurer is a member of the Pennsylvania Legislature and president of the Pennsylvania Federation of Labor, in politics a Socialist and the only member of that party in the General Assembly of the Keystone State. His complaint was in effect that the company and other interurban railways fail to furnish their patrons with proper toilet facilities. He asked for a general order directed against all interurban railways in the State. In the particular case under consideration, in addition to refusing to issue a general order, the complaint against the Oley Valley Railway is dismissed.

The opinion of the commission, written by Commissioner John S. Rilling, is as follows:

"The respondent, the Oley Valley Railway, operates an interurban electric railway from Reading to the Borough of Boyertown, in Berks County, a distance of about 23 miles, its cars making a trip each way every one and one-half hours on week days and every hour on Sundays and holidays. The running time between terminals is one hour and twenty minutes.

"The territory through which the respondent operates is thickly populated and a rich agricultural district. The railway operates on a 5-cent basis and less than 10 per cent of its patronage is through traffic.

"The complaint is that the respondent and other interurban railways fail to furnish their patrons with proper toilet facilities, and asks for a general order directed against all interurban railways in this State.

"It appears that some interurban railways in Pennsylvania already have their cars equipped with proper toilet facilities.

"The subject matter of this complaint is one of importance to the public and good reasons may be urged in favor of the order asked for.

"After due consideration we have reached the conclusion that no general order should be made for the reason that no two interurban railways operate under the same conditions. The length of the route, the running time, the territory traversed, the amount of and character of travel, the density of the population as well as many other facts must all be considered.

"We are of the opinion, considering the length of the respondent's route, its running time, the amount and character of its traffic, the benefits to be derived as well as the inconvenience that would result from an order as asked for, that the complaint in the case under consideration should be dismissed."

An order attached to the opinion dismissed the complaint as of Jan. 3, 1917.

The testimony at the conference at Harrisburg on Nov. 17 on this matter was summarized in the ELECTRIC RAILWAY JOURNAL of Nov. 25, 1916, page 1129.

B. R. T. Starts Efficiency Campaign

A joint efficiency campaign of the men and management of the Brooklyn (N. Y.) Rapid Transit System has been inaugurated on approval of President T. S. Williams.

This campaign, which is described by S. W. Huff, vice-president of the company, in the *B. R. T. Monthly* for December, includes practically all departments where men are employed in large numbers and the plans which are now nearing completion will extend these educational efforts to the surface transportation department, the New York Consolidated Railroad, operating the rapid transit lines, the department of way and structure, the mechanical department and the electrical department.

The object of the educational program will be to make each individual employee realize how his personal efficiency in the performance of his duties can contribute to his own standing and prospects, to the prosperity of the company and to the service which the public receives. Each individual will be reminded of certain definite matters covered by outstanding rules and regulations in which personal efficiency results in a direct gain in net earnings, and the lack of it makes equally certain not only loss to the company, but loss of his own standing in the company service.

The joint efficiency campaign is the outcome of studies which have been made by a special committee on increased net earnings appointed several weeks ago by Colonel Williams.

Because of the wide variety of operations which have to be conducted in the Brooklyn Rapid Transit System, each department proposing to participate in the joint campaign is working out the educational methods best suited to its conditions. In general, however, the educational work will be based on a series of bulletins in each participating department, taking up and explaining a number of the rules and regulations of such department in which the attainment of increased individual efficiency means increased net earnings for the company.

Jitney Matters in Portland

According to a decision of four members of the City Council of Portland, Ore., no franchise will be granted the Union Motor Bus Company to operate jitneys in that city unless the company accepts routes over streets on which there are no street railway lines. This means that the company, which is composed of more than 200 of the owners of jitneys in Portland, must meet the terms of the Council or go out of business.

The Council outlined a proposed standard zone system, governing the charges for taxicabs, which operate under the zone system. This system will supplant the one prepared by Commissioner Daly, which did not meet with the approval of the other members of the Council. Commissioner Daly's plan would permit the taxi-jits to operate on a 5-cent basis on the old jitney routes. Under the new scheme, it is hoped to prevent taxi-jits from operating on a 5-cent fare basis, forcing the operators to take out a jitney franchise, or cease operation. There will be a dozen or fourteen zones in the entire city, while under Mr. Daly's plan the city was divided into 108 zones.

The Portland Trackless Car Company, a subsidiary of the Portland & Oregon City Railway, has filed an application for a franchise to operate jitneys on four additional routes. This makes eight routes for the operation of jitneys sought by this company. It is proposed to make this jitney line a feeder for the Portland & Oregon City Railway and to give transfers from one line to another.

The Council of Portland is considering the granting of a franchise to W. M. Foster for the operation of a line of jitneys between Portland and Linnton. The applicant agrees to pay the city $50 a quarter for each car, and provide a bond of $10,000 to idemnify the city or the public against damage or loss. A 10-cent fare will be charged on account of the long haul, and ten passenger cars will be operated. The Union Motor Bus Company has announced that it will apply for a franchise over the same route.

Because Commissioner Daly of the Department of Public Utilities of Portland, Ore., refused to approve the proposed "standard" zone system, prepared by Commissioner Dieck, to govern the operation of taxicabs and taxi-jit, Mayor Albee has taken away the supervision of all transportation utilities and all franchise matters, and the administration of all ordinances relating thereto, from Commissioner Daly and transferred this authority to Commissioner Dieck.

Service Improvements in Harrisburg

Extensive plans for service improvement on the lines of the Harrisburg (Pa.) Railways were announced on Jan. 1 by Frank B. Musser, president of the company. Changes in schedules giving more frequent service are being arranged, and on Dec. 30 a contract for ten new cars was placed with The J. G. Brill Company, Philadedphia, Pa. The first of these will be delivered during the latter part of May and will probably be used for the first time on Memorial Day. Five of the new cars will be of the all-steel type, similar to the 800 series recently placed in service. These will be used on the suburban lines. The other five will be for city lines and will be similar to the 600 series with longitudinal seats.

Mr. Musser intimated that other changes may be expected in the near future, and said that men are being stationed at congested street intersections to study how traffic conditions can be bettered so that cars can be kept on schedule during the busy hours of the day. Action on further improvements will probably be taken at the annual meeting of the board of directors to be held in March. Work has been started on remodeling and repairing some of the special cars used in the morning and evening to haul the workmen to and from Steelton.

New Company Publication in Baltimore

The United Railways Forum is the title of a new monthly employees' magazine prepared by the United Railways & Electric Company, Baltimore, Md., the first issue of which is dated Jan. 1. The new periodical is introduced in a foreword by W. A. House, president of the company, the theme of which is embodied in the slogan of the company that "The United spirit stands for safe service, courteous service, efficient service." The plan of the new magazine is to print articles upon various phases of the street railway work; the local problems which the company is called upon to face and the means for their solution. It will also devote liberal space to the recreation activities and personal news of the employees and their families. The leading article of the first issue describes the extensive task now being undertaken by the railway, of remodeling 560 semi-convertible, double-truck cars of the open platform type into modern vestibule pay-as-you-enter cars, an illustrated account of which was also contained in the Electric Railway Journal of Aug. 19, 1916.

Railway Participates in Safety-First Parade.—An active part was played by the Nashville Railway & Light Company, Nashville, Tenn., in a "Safety First" parade held in Nashville on Dec. 4. In addition to the display furnished by automobiles in the parade, many of the street railway cars were decorated on the sides with "Safety First" signs and brilliantly illuminated, while other cars were used as floats.

Commission Refuses to Modify Additional Service Order in Lemoyne, Pa.—The Public Service Commission of Pennsylvania in a ruling on Jan. 8 refused a modification of an order in which additional cars on the Harrisburg-Marysville line of the Valley Railways, Lemoyne, Pa., were ordered. The company asked to be relieved of the order because it was declared additional cars were not sufficiently patronized to make them profitable.

Illustrated Safety-First Advertisements in Toledo.—A series of advertisements embodying illustrated talks to automobile drivers has been recently published by the Toledo Railways & Light Company, Toledo, Ohio, in the Toledo newspapers. The illustrations are reproduced from posed photographs showing the common forms of collisions and accidents in Toledo, such as driving past a standing street car, reckless driving on corners, going on the wrong side of the street, careless parking, etc.

More Than Ten Years Without Loss of Life to a Passenger.—The Portland Railway, Light & Power Company, Portland, Ore. calls attention in *Watts Watt*, distributed among its patrons to the fact that not a single passenger has lost his life while riding on one of its cars in the nearly ten years since the company took over the operation of the street railway business in Portland. From Jan. 1, 1907, up to and including Nov. 30, 1916, a period of nine years and eleven months, a total of 810,363,205 persons has been carried.

Jitney Privileges Denied to Minors.—The Public Service Commission of Pennsylvania has refused to grant a certificate of public convenience to operate a jitney to persons under twenty-one years of age. This decision, which will govern in future applications, was made in the cases of applicants from Mifflin and Juniata counties and was reached after an exhaustive inquiry. The applicants had bought an automobile and desired to establish a jitney line, but the commission held that such operators should be twenty-one years of age.

Reprisals Against I. T. S. in Venice.—The City Council of Venice, Ill., on Jan. 5 repealed the ordinances granting franchises to the Illinois Traction Company and instructed the superintendent of streets to notify the company to remove its tracks within five days. The franchises, according to the city attorney, provides for a 5-cent fare from any part of Venice to any part of St. Louis. The company on Dec. 29, under authority from the Interstate Commerce Commission, made the fare 5 cents from the southern limits of Venice and 10 cents from any other part of the town.

Kansas City Railways Making Traffic Study.—Ross W. Harris, consulting engineer of Madison, Wis., whose appointment by the Kansas City Railways to make a study of the traffic conditions there was noted in the ELECTRIC RAILWAY JOURNAL of Dec. 2, 1916, has twenty-eight men employed in making an accurate count of the passengers handled on the various lines, and this count will be continued until the passengers handled on every trip on all lines in the city are recorded. These checkers ride the cars and record the number of off and on passengers at every stop.

Toledo Company Starts Advertising School.—With a view to broadening the knowledge of members of the new business department of the Toledo Railways & Light Company, Toledo, Ohio, a school in advertising has been formed to run through the month of January. Meetings will be held every Monday night, the first on Jan. 8. On this day the men will turn in ads they have written and these will be criticized and suggestions made by E. R. Kelsey, advertising manager of the company. Practical talks from different members of the Toledo Advertising Club will be a feature of the course.

Railroad Commission Asks Rehearing on Jitneys.—The Railroad Commission of California has petitioned the Supreme Court of that State for a rehearing on the court's decision which recently put certain classes of jitney buses and automobile trucks under the commission's jurisdiction. The court is asked to declare the commission's jurisdiction limited to rates and systems of accounts, and to cover only jitney buses and auto trucks which operate as common carriers on regular schedules over public highways between fixed points, one of which points is in a municipality and the other outside the municipality. The commission asks that the court make this declaration either after a rehearing or by a modification of its decision of Dec. 14, 1916.

School Passes Revoked Outside City Limits.—Although the anti-pass law, enacted at the last session of the Kentucky Legislature, became effective on Jan. 1, under the terms of which it had seemed apparent that half-fare privileges now extended to teachers and pupils of the public schools would be curtailed in part, the Louisville (Ky.) Railway will continue to give preferential rates to all pupils and teachers inside the city limits. In the county outside of the city pupils in public and parochial schools will continue to ride for half fare, the law providing for this concession, but pupils in private schools and all teachers in all schools will be required to pay full fare. The concessions are made possible inside the city by provisions in the original charters issued to railways in Louisville.

Conference on Buffalo Fare Case.—Counsel representing the International Railway, Buffalo, N. Y., has agreed to confer with Corporation Counsel Rann regarding the application which will be made by Mr. Rann to the Public Service Commission for an investigation into the rate of fare and charged by the company over its Buffalo city lines. The corporation counsel is making an effort to have the commission order a reduction in fare from 5 cents to 4 cents. It is the desire of the city attorneys to effect a stipulation with the Internationl Railway over the question of having the law settled as to the jurisdiction of the commission in the proposed rate investigation. The company will contend that the commission has no authority in the matter of reducing the rate of fare.

Baltimore Car-Full Measure a Failure.—The Baltimore *Star*, in commenting in its issue of Jan. 5 on the car-full order in that city, said: "Under the car-full rule of the Public Service Commission of Maryland the United Railways & Electric Company was ordered to adhere to a carrying limit for each line of cars, the limit to be fixed by the commission. For several months this rule has been tried and, though there have been efforts on the part of the company to carry it out, it has been found not to have worked successfully under existing conditions. The net result at rush hours, especially during the recent Christmas shopping season, was to force hundreds of people to wait on every downtown street in good weather and bad until cars reached them which were not carrying the maximum number of passengers. This condition was violently protested to the commission by citizens of all sections of the city, and the first real test of the car-full line was virtually pronounced a failure. This through the action of the commission in suspending the order from nearly a week before Christmas until Jan. 1."

Washington & Old Dominion Claims to Be Interstate Carrier.—That the Washington & Old Dominion Railway, Washington, D. C., is an interstate carrier, under the jurisdiction of the Interstate Commerce Commission, is contended in a brief filed with the commission on Dec. 16 by Wilton J. Lambert, general attorney for the company. The brief was filed in connection with a certain case against this company and the Capital Traction Company, involving the question of transfers between the two car lines at Thirty-sixth and M Streets, northwest. The particular point now under consideration by the commission is the question of jurisdiction. It is pointed out in the brief of the company that the line enters Washington over an interstate bridge, has joint and through freight rates with steam railroads, handles express and uses both electricity and steam for locomotion, files its tariffs with the Interstate Commerce Commission and complies with the commission's safety requirements and other regulations. For the above reasons it is contended that the Public Utilities Commission of the District of Columbia cannot be considered to have any jurisdiction over the issues involved in this case regarding the railway.

Street Railway Line Has Right of Way.—The Supreme Court of New Jersey has handed down a decision covering the status of street railways with regard to the State traffic act of 1915 for street vehicles. This measure provides that drivers of vehicles approaching the intersection of a street shall grant the right of way to any vehicle coming from the right. The court holds that such requirement does not apply to motormen on electric railways, reversing a decision of a lower court. The action at issue was brought by a resident of Jersey City for damages against the Public Service Railway. While driving an automobile from an intersecting street east into Monticello Avenue the man who brought suit was struck by a car moving south along such thoroughfare. The lower court decided that the motorman was bound by the provisions of the traffic act and was in error in not giving right of way to the automobile. In reversing this ruling the Supreme Court decided that the traffic measure cannot be held as applicable to street railway lines. It is pointed out that elsewhere in the act drivers of vehicles are directed as to the course to be taken in passing other vehicles, turning corners and, in certain circumstances, veering from one part of the roadway to another. The court said that it is evident that such provisions in the act could not have contemplated street cars, specifically excluding with such considerations electric railway lines.

Hugh M. Wilson Retires

Resigns as First Vice-President of the McGraw Publishing Company Inc.

Hugh M. Wilson, first vice-president of the McGraw Publishing Company Inc., has tendered his resignation and will devote himself to his personal interests. Mr. Wilson has been vice-president of the McGraw company for the past six years, during which time the organization has grown constantly in strength. Two new papers, *Electrical Merchandising* and *The Contractor* have been purchased, *Metallurgical & Chemical Engineering* has been changed from a monthly to a semi-monthly, and the other properties, ELECTRIC RAILWAY JOURNAL, *Electrical World* and *Engineering Record* have made rapid progress.

HUGH M. WILSON

Before joining the McGraw staff, Mr. Wilson had long been a prominent figure in the field of technical journalism, and from 1899 to 1908 was president and chief proprietor of the *Railway Age*. During 1905, the International Railway Congress met at Washington, D. C., and Mr. Wilson offered to publish a daily issue of the *Railway Age* with the papers and a report of each session printed in both French and English. The offer was accepted and the paper was designated as the official journal of the congress. It was a tremendous task from a journalistic standpoint, but through the energy of Mr. Wilson and his staff it was carried out successfully and brought great prestige to the paper and its publishers. In recognition of Mr. Wilson's contribution to the success of the convention through the publication of this daily, he was created a chevalier of the order of Leopold by the King of Belgium.

In 1908 Mr. Wilson sold his interest in the *Railway Age* to the publishers of the *Railroad Gazette*, with which it was consolidated under the name of *Railway Age-Gazette*. At the time of this sale Mr. Wilson also sold his interests in the *Electric Railway Review*, which he had owned for about two years, to the McGraw Publishing Company.

After disposing of these papers Mr. Wilson went abroad for an extended trip and on his return in June, 1909, was elected director and vice-president of the Barney & Smith Car Company of Dayton, Ohio. Mr. Wilson continued with the Barney & Smith Car Company until 1910 and was then elected first vice-president of the McGraw Publishing Company, which position he has just relinquished.

Mr. Wilson's work as a publisher has been marked by his devotion to the highest standards possible, and he has the happy faculty of being able to create in his associates a like enthusiasm and desire to put forth their best efforts. As a writer he combines the qualities of being a keen observer of men and events and ability to express his ideas clearly and convincingly. To these journalistic gifts he added the broad foundation of a long experience in the daily and technical newspaper field. In fact, most of his life, following his graduation from Illinois College in 1887, has been spent in that business.

His first newspaper engagement was as city editor of the Jacksonville (Ill.) *Daily Journal*, but desiring wider experience he went to Minneapolis and accepted a position there as a reporter on the *Evening Star*. That change placed him in touch with the technical journal field, and recognizing its possibilities, he joined the staff of the *Mississippi Valley Lumberman* in 1889. In May, 1891 he changed his desk again to become associate editor of the *Northwestern Railroader* and thus began his career as the railroad journalist. On Sept. 15, 1891, his paper was combined with the *Railway Age*, and he became secretary and treasurer of the consolidated paper. Subsequently he was made manager, and in 1899 he was elected president.

Personal Mention

James Hawson has been elected vice-president of the Trans-St. Mary's Traction Company, Sault Ste. Marie, Ontario.

W. L. Hogarth has been appointed purchasing agent of the Trans-St. Mary's Traction Company, Sault Ste. Marie, Ontario.

G. W. Cook has been appointed engineer of overhead construction of the Central Illinois Public Service Company, Mattoon, Ill.

R. R. Alexander has been elected secretary and treasurer of the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind.

William G. Henshaw has been elected president of the Glendale & Montrose Railway, Glendale, Cal., with office in San Francisco.

Ernest Claxton has been appointed chief engineer and master mechanic of the Fairfax Incline Railroad, with office at Fairfax, Cal.

J. W. Cheney has been appointed claim agent of the Charleston Consolidated Railway & Lighting Company, Charleston, S. C.

G. Stewart has been elected president of the Grand River Valley Railway, Grand Junction, Col., succeeding E. A. Sunderlin, resigned.

Fred Bredlan has been appointed engineer of power station of the Northwestern Ohio Railway & Power Company, at Port Clinton, Ohio.

James Curry has been appointed power station engineer of the West Chester, Kennett & Wilmington Electric Railway, Kennett Square, Pa.

J. H. Brooke, of the schedule department of the Detroit (Mich.) United Railway, has been appointed assistant car accountant of the company.

W. H. Fisher, formerly vice-president of the Chambersburg & Shippensburg Railway, Chambersburg, Pa., has been elected president of the company.

G. M. Simmons has been appointed master mechanic and engineer of overhead construction of the Orange County Traction Company, Newburgh, N. Y.

Henry Gale has been appointed superintendent of the street railway operating department of the Freeport Railway & Light Company, Freeport, Ill.

W. S. Easton has been appointed auditor of the Glendale & Montrose Railway and the Riverside, Rialto & Pacific Railroad, with office at Riverside, Cal.

W. C. Franz, formerly vice-president of the Trans-St. Mary's Traction Company, Sault Ste. Marie, Ontario, has been elected president of the company.

E. J. Andrews has been elected electrical engineer, signal engineer and master mechanic of the Aurora, Plainfield & Joliet Railway, with office at Plainfield, Ill.

R. E. Cornwell has been appointed purchasing agent of the Chicago, Lake Shore & South Bend Railway, Michigan, Ind., and the Southern Michigan Railway.

Edward K. Hall, vice-president of the New England Telephone & Telegraph Company, has been elected a vice-president of the Electric Bond & Share Company, New York.

R. E. Cornwell has been appointed purchasing agent of the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, with office at South Bend, Ind.

William Hartz has been appointed auditor of the New York & Long Island Traction Company, Long Island City, N. Y., and the Long Island Electric Railway, Long Island City, N. Y.

L. E. Hollar has been appointed superintendent of transportation of the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, with office at South Bend, Ind.

Julien H. Harvey, superintendent of efficiency of the Kansas City (Mo.) Railways and first president of the Kansas City Local Safety Council, was re-elected president of the Council at the annual meeting on Jan. 8.

Amos A. Betts has been elected a member of the Arizona Corporation Commission. Mr. Betts has had an extensive steam railroad experience dating from 1890. On February 1, 1915, he was appointed rate expert for the Arizona Corporation Commission, which position he held at the time of his present election.

Ray D. Janes has been appointed general claim agent of the Reading Transit & Light Company, Reading, Pa., and affiliated companies, with offices in Reading, Pa., succeeding Rex D. Billings, resigned. Mr. Janes formerly spent six years as assistant claim agent with the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.

Clyde Furlong, formerly assistant superintendent of the Flint division of the Detroit (Mich.) United Railway, has been appointed assistant division superintendent in charge of interurbans within the half-mile circle. Mr. Furlong will have charge of the interurban carhouse in Detroit and will direct the operation of the cars from the interurban station.

William A. House, president of the United Railways & Electric Company, Baltimore, Md., on Jan. 3 was voted an indefinite leave of absence by the board of directors. After a month's rest, Mr. House will inspect the street railway systems in a number of the larger cities with the view of meeting the future requirements of the local Baltimore situation. He sailed on Jan. 11 for Cuba and South America.

Frank H. Miller, superintendent of motive power, and Samuel Riddle, superintendent of transportation, of the Louisville (Ky.) Railway, as Rotarians, were hosts to 150 members of the Louisville Rotary Club which paid a visit to the power house to see "what makes the street car go." Special cars were provided to carry the visitors from downtown and a buffet luncheon was provided at the plant.

William H. Dinsmore has been appointed traffic superintendent for the British Columbia Electric Railway Company, Vancouver, the appointment taking effect on Jan. 1. For nine months previous to this appointment he was acting traffic superintendent. Mr. Dinsmore started with the company on Feb. 1, 1901, as a conductor, and was promoted in 1909 to the position of inspector and in November, 1915, was made chief inspector.

Robert M. Feustel, a member of the firm of Sloan, Huddle, Feustel & Freeman, consulting engineers, has been elected president of the Fort Wayne & Northern Indiana Traction Company to succeed J. M. Barrett, recently resigned. Mr. Feustel was graduated from Purdue University in the civil engineering class of 1905, and after about two years in railroad construction work joined the engineering staff of the Wisconsin Railroad Commission. He later severed his connection with that commission to become a member of the above-mentioned firm.

Thornwell Mullally, formerly assistant to the president of the United Railroads of San Francisco, San Francisco, Cal., has received a special invitation from Major General Pershing to join the Pershing column in Mexico for an indefinite period, during which he will study military field tactics and procedure at close range. Mr. Mullally's status will be that of "military observer." Mr. Mullally is a graduate of Yale University and also of the New York Law School. He devoted himself to law work in New York until 1906, when he went to San Francisco. In his position as assistant to the president he rendered invaluable public service in connection with the reconstruction and reorganization of the city's transportation facilities following the fire.

Frank Hammond, editor of the *Buzzer*, the weekly employees' publication of the Birmingham Railway, Light & Power Company, Birmingham, Ala., has resigned this position to go into the automobile business. Mr. Hammond was born in Greenville, S. C., in 1882. After a grammar school education he was employed at seventeen as shipping clerk with the Charleston & Western Carolina Railway, which position he resigned after two years' service to accept a place as freight clerk with the Carolina Supply Company. In 1903 he obtained a position as bookkeeper with the Standard Oil Company in Birmingham, where he remained for eighteen months, resigning to accept a position as salesman with the Birmingham Railway, Light & Power Company in February, 1905. He was subsequently promoted to the position of chief salesman, assistant commercial manager, commercial manager and general agent, which position he held in addition to his editorial work.

George Tracy Buckingham has been appointed counsel for the Illinois State Public Utilities Commission. Mr. Buckingham is a Chicago attorney, and formerly practised in Danville, Ill., for a number of years. While in Danville he was president and chief owner of the Danville Belt Coal Company, was district attorney for the Wabash Railway Company, and general counsel of the Illinois Coal Operators' Association. He also became interested in the various railway properties which have been comprised in the Illinois Traction System, and was connected with many coal mining properties. He was also assistant state's attorney of Vermilion county and in 1907 was a candidate for justice of the Illinois Supreme Court in the republican convention of that year. Since removing to Chicago Mr. Buckingham served as a trustee of the Kankakee State Hospital for the Insane from 1897 to 1901, and president of the Joliet Prison Board from 1901 to 1905. From 1886 to 1904 he was active in the affairs of the Illinois National Guard and attained the rank of colonel.

Thomas A. Cross, vice-president and general manager of the United Railways & Electric Company, Baltimore, Md., has been appointed in temporary charge of the duties of president in the absence of W. A. House, who has been voted an indefinite leave of absence by the board of directors. Mr. Cross is a native of Baltimore and has been connected with the street railways in that city since a young man. His first work was with the North Avenue Electric Railway, the service of which he entered in 1890. This company was succeeded by the Lake Roland Elevated Railway, and Mr. Cross was advanced until in 1893 he was selected by the Baltimore Traction Company to take charge of its overhead work, motor equipment and power stations. When this company was consolidated with the City & Suburban Railway as the Consolidated Electric Railway Mr. Cross's duties were further increased, and in 1899, when all the lines were merged as the United Railways & Electric Company, Mr. Cross was appointed to the position of superintendent of overhead work, cables, etc. In April, 1907, he was appointed general manager of the company and in May, 1911, he was also elected second vice-president.

Obituary

Sir George White, Bart., one of the pioneers of electric tramways in England, died suddenly at Bristol in November last. He was born in Bristol in 1854, and obtained his early education at St. Michael's Boys' School in that city, but before he had been there long he had to go out into the world to earn his living. In 1874 he was appointed secretary of the company which opened the first tramway line in Bristol, but a year later he started for himself as a stockbroker, and so for a time lost touch with the tramway world. Later his efforts were directed to obtaining control of isolated and semi-derelict railway lines, and consolidating them into main-line systems. About 1893, he and his brother, his partner, secured control of the Imperial Tramways Company, and with Sir Clifton Robinson, who had just returned from the United States, promoted extensions in Dublin and Middlesbrough, where the company owned lines, substituted electricity for horsepower, and completely transformed the company both financially and from the point of view of the passengers' comfort. The Bristol Tramways, of which Sir George was successively secretary, managing director, and chairman, was also developed marvellously. The triumvirate of experts next turned their attention to what was then London's need as far as street traction was concerned. They bought up the West Metropolitan Tramways, reconstructed that undertaking into the London United Tramways, and then, after a long and strenuous fight, extending over years, secured for London the benefit of electric traction, and created a great undertaking, from which Sir George retired in 1903.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

Globe, Ariz.—The franchise held by the Globe-Miami Traction Company in Globe has reverted back to the city through the action of the City Council. By the terms of the franchise, L. L. Litchfield, president of the company, will receive $1,500 to reimburse him for money expended to interest capital in the project. [June 19, '15.]

***Los Angeles, Cal.**—It is reported that Henry M. Denison, Los Angeles, has asked the Council for a franchise to construct a double-track electric railway on Main Street from Slauson Avenue to Manchester Avenue.

Hartford, Conn.—The Norwich & Hartford Traction Company has asked the General Assembly for an extension of time to 1921 in which to construct its proposed line between Norwich and Hartford.

Peoria Heights, Ill.—The village of Peoria Heights will give a new franchise to the Peoria Railway in place of the one recently revoked by the Village Council. The village will allow the company to place the tracks on the river side of the road instead of in the center, as they are now.

Wilmette, Ill.—The Chicago, North Shore & Milwaukee Electric Railroad has asked the Council for an indefinite extension of its franchise through the village of Wilmette.

Boston, Mass.—The Boston Elevated Railway has filed a petition with the Public Service Commission asking for an extension of time in which to complete the Everett-Malden elevated line.

Tonawanda, N. Y.—The International Railway has made application to the town board of Tonawanda for permission to construct an extension to its line along the River Road from the Grand Island Ferry road to Tonawanda, about 5 miles. The company now maintains a single track line upon which one car is operated from the Buffalo city line at Riverside Park to the Grand Island Ferry Road, about 1 mile. This line will be rebuilt and if the franchise is granted for the extension along the Niagara River to Tonawanda the company will be able to handle the traffic to and from the large industries now under construction along the Niagara River between the Buffalo city line and Tonawanda. The proposed line has already been surveyed and a hearing on the company's application will be held in Kenmore, N. Y., Jan. 20.

Cincinnati, Ohio.—The street railway committee of the City Council has approved an extension of ten years in the franchise for one of the lines of the Interurban Railway & Terminal Company. The franchises of the company will now all expire at the same time.

Dallas, Tex.—Commissioners of Dallas County, on application of E. P. Turner, representing the Dallas Northwestern Traction Company and the Dallas Southwestern Traction Company, granted extensions of twelve months on the franchises recently secured by these companies. The City Commission of Dallas recently extended the franchises six months, although Mr. Turner at that time asked for extensions of one year. [Dec. 23, '16.]

Vancouver, Wash.—The City Council has pledged to give a franchise to the Columbia River Interstate Bridge Commission to construct tracks from the bridge up Washington Street to Second Street, and from the bridge to Main Street on First Street, and up Main Street to Second Street. The Portland Railway, Light & Power Company is to extend the track on Main Street from Second Street to Third Street and lay a third rail down Third Street to Washington Street and down Washington Street to Second Street, thus making a loop around Third Street for both the North Coast Power Company and also the Portland Railway, Light & Power Company.

TRACK AND ROADWAY

Birmingham (Ala.) Interurban Development Company.—It is reported that arrangements have been completed for financing this company's proposed line from Birmingham to Jasper. W. W. Shortridge, Birmingham, secretary. [June 17, '16.]

Mobile, Volanta & Pensacola Railroad, Mobile, Ala.—This company reports that it will construct a line between Gabel and Elberta, 20 miles.

Fort Smith-Oklahoma Light & Traction Company, Fort Smith, Ark.—This company will construct about 1 mile of track during 1917.

Fresno (Cal.) Interurban Railway.—A report from the Fresno Interurban Railway states that it will construct an extension between Academy and Centerville, 10 miles, during 1917.

Montecito Railroad Company, Los Angeles, Cal.—About 1 mile of new track will be built by the Montecito Railroad during 1917.

Pacific Electric Railway, Los Angeles, Cal.—Condemnation proceedings have been filed at Santa Ana by the Pacific Electric Railway preparatory to the construction of a 5-mile right-of-way from La Habra to Fullerton. In the papers filed the company states that it is the intention to build a line to Riverside through Santa Ana Canyon and to build a branch to Santa Ana from La Habra, one of the points in the proposed Riverside line.

***San Francisco, Cal.**—At the request of local steamship operators, James J. Walsh, San Francisco, has prepared preliminary plans for an elevated electric railway along the waterfront from the Channel to Fort Mason, about 2.8 miles, at an estimated cost of $1,120,000.

Connecticut Company, New Haven, Conn.—Petitions have been filed with the State Secretary by the Connecticut Company for permission to construct extensions in Hartford, Waterbury, Bridgeport, New Haven, Meriden, Cromwell, Norwich and Thomaston.

Shore Line Electric Railway, Norwich, Conn.—It is reported that this company contemplates the construction of a line between Westerly and Bradford.

Georgia Railway & Power Company, Atlanta, Ga.—This company will construct about 6 or 8 miles of new track this year.

Aurora, Mendota & Western Railroad, Aurora, Ill.—Construction will be begun in the spring by the Aurora, Mendota & Western Railroad on its proposed line between Aurora and Mendota. One pile bridge, three concrete bridges and five concrete culverts will be constructed. H. D. Hallet, Aurora, chief engineer. [Dec. 23, '16.]

Chicago, Fox Lake & Northern Electric Railway, Chicago, Ill.—This company has received permission from the Illinois Public Utilities Commission for the construction of an extension from Wauconda to Antioch and to the Wisconsin State line. L. K. Sherman, Chicago, chief engineer. [Dec. 2, '16.]

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—The Board of Public Works has asked the Indianapolis Traction & Terminal Company to construct an extension on Illinois Street from Thirty-ninth Street to Forty-sixth Street.

Western Maryland Railway, Baltimore, Md.—It is reported that the Western Maryland Railway has under consideration the use of electrically-operated trains on its grades over the Blue Ridge Mountains.

***Boothbay, Me.**—It is reported that plans are being made to construct an electric railway from Boothbay to connect with the Lincoln and Knox County branch of the Maine Central Railroad, the cost being estimated at $150,000.

Kansas City, Lawrence & Topeka Electric Railway, Kansas City, Mo.—This company has completed the expenditure of about $20,000 for ballasting and other improvements. It will build immediately 1 mile of track extending the line to Zarah, where a station will be built. The new construction involves a 125-ft. span bridge over Mill Creek, and an overhead crossing over the Santa Fé Railroad, this extension being on the proposed route toward Lawrence, Kan.

Kansas City & Tiffany Springs Railway, Kansas City, Mo.—The Union Mutual Development Company, W. E. Winner, president, which had exploited Tiffany Springs, near Kansas City, and had planned an electric line thereto, is the subject of involuntary bankruptcy proceedings in the Federal Court, the petitioners being the Dwight Building Company, claiming rent due of $585; Mrs. Myra B. Winner, claiming money advanced $1,276.49, and Frances Walton, stenographer, claiming $210. Among the obligations listed in the schedules later filed are about $41,000 in secured notes, bearing on the real-estate project; and $5,892.30 owing variously, including about $800 for engineer's plans and services, and $1,282.71 owing to employees. [Mar. 11, '16.]

New York Municipal Railway Corporation, Brooklyn, N. Y.—The Public Service Commission for the First District of New York has awarded a contract to Lupfer & Remick, Buffalo, N. Y., for the installation of third-rail, track bonding and miscellaneous electrical equipment on the Culver line of the New York Municipal Railway Corporation at $101,000.

Cleveland (Ohio) Railway Company.—Councilman Damm has announced that he will ask for the extension of Wade Park Avenue to East Fifty-fifth Street, in order to reroute the car line on that street over Superior Avenue west from East Fifty-fifth Street. Legislation has been enacted to extend this thoroughfare from East Sixty-first Street to East Sixty-third Street and it is now open between East Fifty-seventh and East Sixty-first Streets. These improvements, with the one to be asked, will straighten the route and make the running time considerably shorter. Councilman W. F. Thompson will ask for the extension of the Union Avenue line from East 112th Street to East 140th Street.

Portsmouth Street Railroad & Light Company, Portsmouth, Ohio.—An extension between Ironton and Hanging Rock, 2 miles, will be built by the Portsmouth Street Railroad & Light Company. All material for the construction has been purchased.

Ardmore (Okla.) Railway.—The Ardmore Railway plans to construct about 30 miles of new line during this year, the extension probably being built northwest from Ardmore.

Oklahoma & Northern Traction Company, Bartlesville, Okla.—W. K. Palmer Engineering Company, Kansas City, has completed the engineering work for the North Division of the Oklahoma & Northern Traction Company system, including 32 miles of track from Columbus, Kan., to Miami, Okla., and a short branch to Baxter Springs, Kan. Construction work will begin soon. Correspondence regarding material and equipment will be handled by the W. K. Palmer Engineering Company. The engineering work on the south division from Miami to Bartlesville, Okla., is also nearing completion and will be ready for construction soon. [Dec. 23, '16.]

Tulsa (Okla.) Traction Company.—The Tulsa Traction Company announces that plans are being formed for installing a street railway system in Tulsa. An interurban line is being projected by the company to extend northward to Collinsville. The company is now building a line from Tulsa to Sapulpa. It is planned to have this line completed and in operation within six weeks.

London & Port Stanley Railway, London, Ont.—The London Railway Commission is considering the construction of 600 ft. of retaining wall to protect the right-of-way in front of the station at Port Stanley from the encroachments of Kettle Creek. The estimated cost of the work is $6,500.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, Philadelphia, Pa., William S. Twining, Director, for the construction of the following sections of the Delivery Loop Subway with work appurtenant thereto: Contract No. 201—2567 lin. ft. of two-track subway in Arch Street, between Broad Street and Eighth Street including two stations; contract No. 202—2600 lin. ft. of two-track subway in Eighth Street, between Arch Street and Locust Street, including one station; contract No. 203—2600 lin. ft. of two-track subway in Locust Street, between Eighth Street and Broad Street, including two stations. Copies of plans and specifications may be obtained upon deposit of $50, to be refunded upon return of plans.

Quebec Railway, Light & Power Company, Quebec, Que.—This company reports that it will construct an extension from Third Avenue and Fifth Street along the Beauport Road East to the city limits, about 1½ miles.

Charleston-Isle-of-Palms Traction Company, Charleston, S. C.—This company reports that during 1917 it expects to double-track about 1 mile of its Navy Yard line.

Salt Lake & Ogden Railway, Salt Lake City, Utah.—During the next few months the Salt Lake & Ogden Railway plans to construct a second main track between Centerville and Farmington and to connect the double track between Layton and Clearfield. When this is completed the road will be double track all the way to Clearfield, leaving about 8 miles of single track on the whole line. The track between Bountiful and Centerville is to be reballasted and the 60-lb. rail will be replaced by 85-lb. rail.

Virginian Railway, Norfolk, Va.—It is reported that the Virginian Railway is making investigations with a view to the possibility of operating electric locomotives on its line between Elmore and Clarks Gap for the handling of heavy coal trains.

SHOPS AND BUILDINGS

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—An interurban passenger station, a package freight depot and carhouse will be built at Sixth and Clybourn Streets, Milwaukee, by the Chicago, North Shore & Milwaukee Railroad. The company purchased the property, which has a frontage of 270 ft. on Sixth Street and a depth of 150 ft. on Clybourn Street, at a cost of $200,000.

Fort Dodge, Des Moines & Southern Railway, Boone, Iowa.—It is reported that the Fort Dodge, Des Moines & Southern Railway and the Chicago & Northwestern Railway plan to construct a passenger station at Webster City at a cost of about $50,000.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded a contract to the Seventh Avenue Construction Company, New York, for station finish for nine stations on the lower portion of the Seventh Avenue subway between the Battery and Fourteenth Street, inclusive. The contract price for the work is $389,880. Two of the nine stations are express stations. The six remaining stations on this line are already under contract. The Seventh Avenue Construction Company was the lowest bidder for the construction of station finish for six of the stations on the underground portion of the Southern Boulevard and Westchester Avenue extension of the Lexington Avenue subway. This portion of the extension begins under East 138th Street and terminates near Whitlock Avenue and Bancroft Street. Thence to its terminus at Pelham Bay Park the line is an elevated structure. No bids have been taken for stations on the elevated portion of the line.

Oshawa (Ont.) Railway.—It is reported that the Oshawa Railway will soon let contracts for the construction of a carhouse at Oshawa, new rolling stock and other equipment to cost about $100,000.

Eastern Pennsylvania Railways, Pottsville, Pa.—This company's carhouse at Palo Alto was destroyed by fire on Jan. 6, as described in the news department of this issue.

POWER HOUSES AND SUBSTATIONS

Kentucky Traction & Terminal Company, Lexington, Ky.—A program of betterments for the Kentucky Traction & Terminal Company to cost about $200,000 has been announced by S. H. Dailey, general manager of the company. The installation of a new 4000-kw. generator and provision for nine voltage regulators are included.

Toledo Railways & Light Company, Toledo, Ohio.—Work has been begun on the new power house for the Toledo Railways & Light Company on the Maumee River near the center of the city. Contracts have been let to M. V. Kellogg & Company, New York, for two stacks, each 275 ft. high and 16 ft. inside diameter, to be constructed of radial brick.

Philadelphia (Pa.) Rapid Transit Company.—This company plans to reconstruct and extend its power plant on Kensington Avenue, Philadelphia.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

Line-Material Orders Indicate Unusual Activity

Reports Considerable Trolley Maintenance Material Business Reported—Prices on Malleable Parts Continue to Rise—Composition Insulation Scarce, but General Manufacturing Situation Improved

E. F. Wickwire, sales manager of the Ohio Brass Company, when recently interviewed by a representative of the Electric Railway Journal, stated that in normal years trolley material orders are usually scarce in the winter months, but that the inquiries in November and December, 1916, were and still are numerous and that the sales are comparatively large—larger, in fact, than those for ordinary summer months. The material now being ordered is mostly for maintenance and renewal work. Little material is being purchased for extensions or for new lines. The underlying reasons for this condition have been set forth frequently. A remarkable increase in the number of trolley-wire splicers purchased is a definite indication of the plan now being followed by most roads to retain old trolley wire in service just as long as it can possibly be made to do the work.

Labor and Raw-Material Situation Still Tense

The raw-material price situation continues tense. Prices on malleables, such as are used for line-material manufacture, have been advanced 20 per cent. within the last thirty days, notwithstanding an increase on Jan. 1, 1916, of 30 per cent, and the necessary payment throughout the year of bonuses in order to get deliveries from the foundries. Malleable castings for overhead fittings require special care in making. The ordinary run-of-the-foundry malleable casting is not sufficiently accurate nor are its surfaces smooth enough. Accuracy also is particularly desirable, and to assure uniformity in strength the castings must be properly annealed. In busy times all of these requirements for the malleable foundries mean increased difficulty for the line-material manufacturer, not only to get deliveries but to maintain his standard quality of product. Close supervision of foundry practice and thorough inspection of output are the safeguards used.

Composition insulation, which forms a most important part of insulated hangers, has at times during the past year been the cause of much embarrassment to the line-material manufacturers. For example, one important ingredient in the composition insulation manufactured by the Ohio Brass Company is imported, and in normal times its price ranges from 14 cents up to 18 cents per pound. That material now costs about 40 cents per pound and is difficult to get. Early last year one cargo was entirely lost, and this necessarily interfered with manufacturing progress. The prices of other ingredients in composition insulation have not risen in proportion to those of materials which are imported, but still the prices have advanced substantially and the supply of raw material has been irregular.

The market and delivery conditions on copper and zinc are well known. These, next to the labor situation, have probably during the last year caused the overhead line material manufacturer the most trouble. As an illustration of the problems met in the labor end of the manufacturing business, Mr. Wickwire cited an example of one workman and said that this was typical of many. This man was employed in March, 1916, as a common laborer at 17 cents per hour. He was a green foreigner. In April he was raised to 20 cents per hour, and in May he had become broken in to do certain jobs and was raised to 25 cents per hour. A few months later a munition job appealed to him, and he suddenly left to get 30 cents per hour. He was typical of a class that had been taught to do certain work and therefore was more valuable on account of his experience than a new man could possibly be for some time. Hence, the company had to hire him back at still greater wages in order to avoid breaking in a new man.

The raw-material situation, Mr. Wickwire said, is gradually being relieved as manufacturers are catching up with their large orders. The production problem is now fitted to a schedule. It proceeds regularly except when special designs are ordered. Then, when new patterns are required and only small lots are to be made, it is difficult first to get the patterns made, then to get them started through the foundry. Later the special job has to be forced into the shop schedule where large standard lots are commanding the tool equipment. Now more than ever does standardization mean much to the manufacturer as well as to the railway.

J. G. Buehler Discusses Car Equipment and Tool Specialties

Increased Production, Careful Handling of Labor Problems, and Large Reserve Supply of Raw Materials Are the Only Factors Which Will Prevent Further Advance in Prices

J. G. Buehler, president of the Columbia Machine Works & Malleable Iron Company, Brooklyn, N. Y., when interviewed recently by a representative of the Electric Railway Journal, reported that orders for accessories, such as forgings, brake-rigging repairs, armature and field coils, brushholders, armature and axle bearings and electrical repair tools, which have long been delayed, are being received regularly. Although no exceedingly large individual orders have been placed, with one or two exceptions, the aggregate of all the orders is considerable. Furthermore, the prospects are that orders for the next three months will total even more than those placed for the same period previous to this time.

Prompt Deliveries Being Made

This company has been particularly fortunate in being able to make prompt deliveries. This has been due directly to the fact that a large reserve supply of raw materials was obtained before prices were forced up by the present crisis, which has been particularly acute in the material and labor markets during the last nine months. With the possible exception of orders which required large amounts of brass and copper tubing, brass sheets and magnet wire, no difficulty has been experienced from a shortage of raw materials, and in these cases the materials were obtained practically regardless of cost in order that the product might be supplied without too great a delay to the purchaser. With the exception of malleable castings, on which about three months' delivery is required, nearly all orders have been delivered promptly, and to quote Mr. Buehler, "Not more than a dozen letters have been received complaining of not having received deliveries on the dates promised."

As a considerable percentage of the business consists of repair parts, including motor axle bearings, brushholders, brake pins, third-rail contact shoes and iron and brass forgings of different kinds, about $50,000 worth of repair parts are kept in stock. In addition, complete stocks of patterns, dies, jigs and drilling templets (75 per cent of all of the patterns, etc., being for repair parts) enable the company to make exceedingly quick deliveries. Patterns and dies (some of which cost $500 a set) are seldom destroyed, and if an order is obtained but once in two years, it is

cheaper to keep the dies on hand than to try and reproduce them. The advantage of keeping on hand these large stocks of patterns and dies, which are said to represent an investment of more than $100,000, is evident. In case of a breakdown, due to the failure of a casting or forging in a company's equipment, it is imperative that the repair be made quickly. An order for a new casting is usually phoned in or the broken part is received by express. The pattern is then taken from the shelf and put in the sand, the mold is poured and the casting is machined and shipped by express to the customer the next day. This applies to almost any type of casting, as the company has its own gray iron shop, brass foundry, sheet-iron shop, machine shop, forge shop, pattern shop and foundry, and maintains a considerable night force. By this procedure a large volume of emergency repair business has been obtained. On the other hand, these repair jobs are expensive, and if time permits a near-by purchaser will often place his order with a manufacturer in a distant town where the cost of labor is considerably less and where raw material can be more readily obtained.

Labor Problems Difficult

The most serious problem which this company has had to confront is that of skilled labor. Although wage increases of from 15 to 25 per cent have been made throughout the plant, machinists, tool makers, molders, sheet-iron workers, etc., have been exceedingly hard to keep. As an incentive to the men to make more money, a bonus system was placed in operation, and this has not only increased production but has helped materially in making better deliveries. In addition to the bonus system, the foremen in the plant, and all of the office help, clerks in the shipping department, etc., received an extra month's salary at Christmas, and a present was made to every man on the payroll of a $5 gold piece.

Tight Money Means High Prices

A large reserve supply of raw materials, careful handling of labor and increased efficiency in shop methods are the factors which are working against a further advance in prices. Some of the manufacturers are fortunate in having immense stocks of raw materials, and these are invariably the last to increase prices. Payments for purchases of raw material by manufacturers from the mills and factories are now quoted at thirty days net, where formerly sixty to ninety days could be obtained. This has caused inconvenience to some manufacturers, as in many cases production has more than tripled in the last two years, and it is necessary for the manufacturers to borrow money from the bank or have an immense outlay. In some lines, when the mills tighten up on the manufacturer, he in turn requires prompt payment from the customer or jobber, but this rule hardly applies where the customers are all railways, because they discount their bills promptly.

Steam Roads Show Big Gains

Small Mileage Increase but Equipment Ordered Exceeds That for Any Year Since 1912, Earnings Per Mile Exceed Previous High Record

The year 1916 has been one of record-breaking traffic and earnings for the railways of the United States. This fact is well known to the manufacturing as well as the operating side of the electric railway industry and therefore the following statistics, gathered by the *Railway Age Gazette*, will be of interest.

The mileage of new steam railroad track built during 1916 was 1098 miles. In 1915, only 933 miles were built, this having been the smallest amount of new construction in any year since the Civil War. The largest amount of new construction was in Montana, where 99 miles of railway were built; South Carolina being second with 92 miles, and California third with 78 miles. New construction in Canada shows a heavy decline. The new mileage found to be projected in the United States is 727; that being surveyed, 2126 miles; and that being actually built, 1060 miles.

The increase in the purchase of new steam road equipment was much greater relatively than the increase in new construction. The following table gives the number of cars and locomotives ordered by the steam railways of the United States within the last three years:

	1916	1915	1914
Freight cars ordered	170,000	107,796	80,264
Passenger cars ordered	2,349	3,092	2,002
Locomotives ordered	2,923	1,573	1,265

The number of freight cars ordered for domestic service is larger than in any year since 1912, and the number of locomotives ordered for domestic service is larger than in either 1914 or 1915. The number of freight cars ordered for export was 25,632, as compared with 13,222 in 1915; and the number of locomotives ordered for export was 2983, as compared with 850 in 1915.

The year closes with sixty-three railways having an aggregate of 34,559 miles of line in the hands of receivers. This compares with a mileage of 38,661 which was in the hands of receivers at the beginning of 1916.

The total mileage of railways operated under the block system at the end of the year is 99,885. Of this, 32,978 miles is automatic, an increase of 1818 miles.

In the five years ending with 1906 the total number of freight cars ordered was almost 1,100,000, or an average of over 218,000 a year. In the five years ending with 1916 the number ordered has been only about 740,000, an average of about 148,000 a year.

The foregoing statistics set forth in a startling manner one of the most important facts to be considered in connection with the present situation of the railways. The car shortage and traffic congestion of 1906 came at the end of a decade during which there had been a great expansion of transportation facilities, while the car shortage and congestion of traffic in 1916 have followed immediately on the heels of a long period of depression during which the increase of facilities has been relatively small. Since steam railway facilities have proved inadequate at the beginning of the present period of prosperity, what kind of a situation will it cause to develop if industry steadily grows more active and traffic heavier, as it did for several years prior to 1906?

The net operating income of the steam railways during the year just closing has been unprecedented, probably averaging more than 6 per cent on the investment in road and equipment. Until within the last eighteen months average gross earnings per mile per month had exceeded $1,300 in only one month, October, 1912. In August and September, 1916, all previous records were broken with earnings of $1,418 and $1,409 per mile.

General Business Conditions

General Feeling of Optimism for Future, Except in Sections Having Poor Crops

The general business conditions throughout this country near the end of 1916, as reported by the committee on statistics and accounts of the Chamber of Commerce of the United States, are good, as may be judged from the accompanying chart. Although optimism is the general feeling, there are some sharp exceptions to this in those sections where the crops are poor, but on the whole the showing is much better than that made last year, as indicated by a sim-

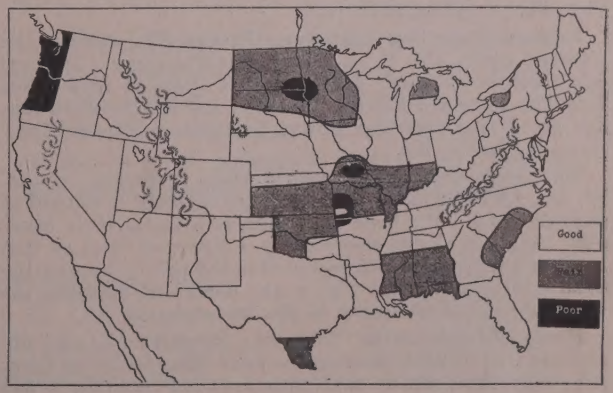


CHART SHOWING BUSINESS CONDITIONS IN THE UNITED STATES AS OF DEC. 2, 1916

ilar chart in the ELECTRIC RAILWAY JOURNAL of Jan. 15, 1916, page 127.

At the present time, it is said, there is little apparent fear of there being in the near future that readjustment which it is generally believed will come with peace in Europe. There is concern in some sections, however, as to the probable effect upon demand of the present high prices, and especially if they should increase.

ROLLING STOCK

Geneva, Seneca Falls & Auburn Railroad, Waterloo, N. Y., is reported to be in the market for two cars to be used on its Geneva city lines.

Eastern Pennsylvania Railways, Pottsville, Pa., lost twenty open and service type cars on Jan. 6 in a fire which destroyed its Palo Alto carhouses.

Illinois Traction System, Peoria, Ill., is having the following cars built by the American Car & Foundry Company: 100 box cars, 60 hopper-bottom coal cars and 40 flat-bottom gondolas. In addition, the company has received a snow-plow from the McGuire-Cummings Manufacturing Company.

International Railway Company, Buffalo, N. Y., has awarded a contract to the Kuhlman Car Company of Cleveland, Ohio, for rebuilding twenty old-type cars. In addition, ten old cars are being rebuilt in the company's Cold Spring car shops. They are being equipped with new vestibules, folding steps, cross-seats, etc.

East St. Louis & Suburban Railway, East St. Louis, Ill., noted in the ELECTRIC RAILWAY JOURNAL of Dec. 16, 1916, as expecting to rebuild five closed motor cars, have ordered these from the American Car Company, and have specified the following details for this equipment:

Seating capacity	44
Weight (car body only)	16,000 lb.
Bolster centers, length	22 ft. 4 in.
Length of body	31 ft. 8 in.
Over vestibule	46 ft. 4 in.
Width over sills	8 ft. 6 in.
Body, wood or metal	Metal
Interior trim	Agasote
Headlining	Agasote
Roof, type	Arched
Underframe	Metal
Air brakes	General Electric
Axles	American Car
Bumpers	Hedley Anti-climbers
Cables	Westinghouse
Car trimmings	American Car
Control type	GE. PC. Westinghouse K36J Double end
Window fixtures	American Car
Destination signs	Hunter Illuminated
Curtain material	Pantasote
Door operating mechanism	American Car
Gears and pinions	GE Grade M
	Westinghouse
Hand brakes	Adams & Westlake, No. 46 staff
Heaters	Peter Smith Electric
Journal boxes	American Car
Motors, type and number	2 West. 532-B
Motors	Outside hung
Registers	Ohmer
Sanders	Leach Locotype air
Sash fixtures	American Car
Seats, style	Hale & Kilburn
	Walkover
Seating material	Rattan
Step treads	Feralin safety
Trolley base	Peerless
Wheels	Davis cast steel

TRADE NOTES

McQuay-Norris Manufacturing Company, St. Louis, Mo., announces that three mechanical engineers—H. C. Coleman, Carl E. Finch and H. R. Souther—have been added to its sales force in the field.

Automatic Ventilator Company, New York, N. Y., has been appointed exclusive sales agent in the State of Ohio for the sale of the "Flower" brush holder, air handles, controller handles, etc., by the manufacturer, D. B. Flower of Philadelphia, Pa.

Johnson Fare Box Company, Chicago, Ill., through its Eastern agent, the U. S. Metal Manufacturing Company, has received an order for thirty-five Johnson fare boxes from the Maryland Electric Railways and one for 210 Johnson fare boxes from the United Railways & Electric Company, Baltimore, Md.

Ohio Brass Company, Mansfield, Ohio, is assignee of patent No. 1,209,742 dated Dec. 26, 1916, covering a method of bonding rails. The bond is formed of a plurality of members having the ends encircled by a sleeve of steel or iron to form a terminal which is united to the rail by heating the bond ends and the rail with a gas flame and applying the attaching metal integrally to the heated parts.

Horne Manufacturing Company, Brooklyn, N. Y., announces that as an adjunct to the Lord Manufacturing Company's products which have been acquired recently, it has arranged to take over the railway output of the Channel Packing & Rubber Company, New York, N. Y., and is now in a position to supply air brake hose and rubber hose of all kinds, "Wedgeset" cylinder and piston packing and "Marvel" sheet packing, gaskets, etc.

Presto-O-Lite Company, Inc., Indianapolis, Ind., announces the organization of its many activities in the railway field into a separate and distinctive department of railway sales and service, in charge of Stanley D. Winger, manager of railway sales and service. This places at the disposal of the electric railways a corps of specialists on oxy-acetylene welding and cutting, brazing, lighting and the many other forms of acetylene service.

Edward N. Hurley of Chicago, who was appointed a member of the Federal Trade Commission at the time of the formation of the commission, two years ago, and who for the last year has been the chairman of the commission, has resigned that office in order to resume his business connections in Chicago as presiding officer of the Hurley Machine Company and other corporations in which he is interested.

H. W. Johns-Manville Company, Cleveland, Ohio, has opened a new office at 911 Walnut Street, Des Moines, Iowa, thus bringing the total number of its branches up to fifty-five. William B. Roberts, who has been with this organization for a number of years in the Iowa district, has been appointed manager of the new office, and will have under him a corps of salesmen and construction men which will enable the company to give the highest class of service.

Van Dorn Coupler Company, Chicago, Ill., reports that it has received within the last few weeks a number of coupler orders, which include the following: J. G. Brill Company, for the cars of the United Railway & Electric Company, Baltimore, Md., 200; Brooklyn Rapid Transit Company, 450; Western Wheeled Scraper Company, 10, and Chicago Elevated Railways, 100. The types of couplers ordered vary from the small link-and-pin to the heavy interurban M. C. B. type. The Brooklyn and Chicago Elevated orders call for both motor car and trailer car types.

Samuel G. Hibben, formerly head of the engineering department of the Macbeth-Evans Glass Company, Pittsburgh, Pa., and associated with the Westinghouse Electric & Manufacturing Company, has recently become identified with the Westinghouse Lamp Company. Mr. Hibben is well known in the several electrical and engineering organizations, and particularly for his activities in the Illuminating Engineering Society, being chairman of the Pittsburgh section. He has also been engaged in consulting work in the lighting of a number of large buildings. Mr. Hibben will continue in engineering work and will make his headquarters at the Pittsburgh office.

Ohmer Fare Register Company, Dayton, Ohio, reports that a decision was handed down on Dec. 15, 1916, by the United States Circuit Court of Appeals in a suit for infringement brought by the company against the Recording & Computing Machine Company of Ohio, the Dayton Fare Recorder Company of Ohio, and the Dayton Fare Recorder Company of Washington, D. C. The court found that the defendants had infringed claims, 4, 6 and 13 of patent No. 646,757, issued April 3, 1900, to John F. Ohmer, relating to improvements in multiple fare recorders. As stated in the specification of this patent, "in a broad sense the improvements comprise mechanism by means of which printed statements, impressions, or records of the different classifications of fares, of the month and day of the different trips, and of the number of the register may be taken on a single sheet and by a single operation."

ADVERTISING LITERATURE

Rowan Electric Manufacturing Company, Inc., of Baltimore, Md., has prepared a loose-leaf booklet on its Automatic Protective and Control Devices for Electric Motors.

Metropolitan Engineering Company, Brooklyn, N. Y., has issued a bulletin on "Cable Failures and the Remedy." This bulletin contains a detailed description of an oil-filled cable joint, which is used on cables carrying up to 16,000 volts.

Stromberg-Carlson Telephone Manufacturing Company, Chicago, Ill., has issued a pamphlet on its new test set No. 844. This set is a complete telephone in every respect, including in its equipment, transmitter, receiver, generator, hook switch and battery.

A 4000-Page Reference Work on Car Construction

THIS is **not** to introduce a new treatise on the subject of car and truck design—it is merely to remind those connected with or interested in the electric railway field of the existence, in convenient form for reference, of a most comprehensive work containing more than 4000 pages (4056, to be exact) —Brill Magazine. Ten years ago the first issue of Brill Magazine made its appearance as a 24-page publication without a cover and printed for the purpose of telling each month of the cars and trucks that were being built by The J. G. Brill Company. Seven years ago the publication was enlarged to a 32-page organ with a cover and a frontispiece insert. Regularly each month Brill Magazine has made its appearance and thus those who have saved their copies from the very beginning have ready to hand a reference work which we feel justified in calling valuable. The magazine has just closed its tenth year—one hundred and twenty issues — and we feel that during those ten years it has served us well in giving to its readers information on new types of equipment and incidental information on new lines, new methods of operation and improvements in this thing or that thing connected with the railway field. It is our purpose to try and make our magazine an ever increasingly valuable source of information on current phases of car and truck design and upon other topics which are of interest. The contents of the publication are not confined to bare descriptions of cars and trucks but include descriptions of the conditions under which the various types are operated. In addition, in each issue we attempt to incorporate something of general interest and direct usefulness to managers and operators. This material is designed for use in company's pamphlets, pay-envelope stuffers and for all sorts of employe-welfare work. Through our Brill Railway Publicity Service we are coming into direct contact with the advertising problems of the various railways and the information and data which we obtain from this source is constantly referred to in the preparation of material for our magazine. Brill Magazine is representative of four large car-building plants whose products constantly are being developed in the direction of greater safety, comfort, convenience and higher earning power. Each improvement, each step in the development of car design is recorded in Brill Magazine in the hope that it may be of interest and benefit to the field.

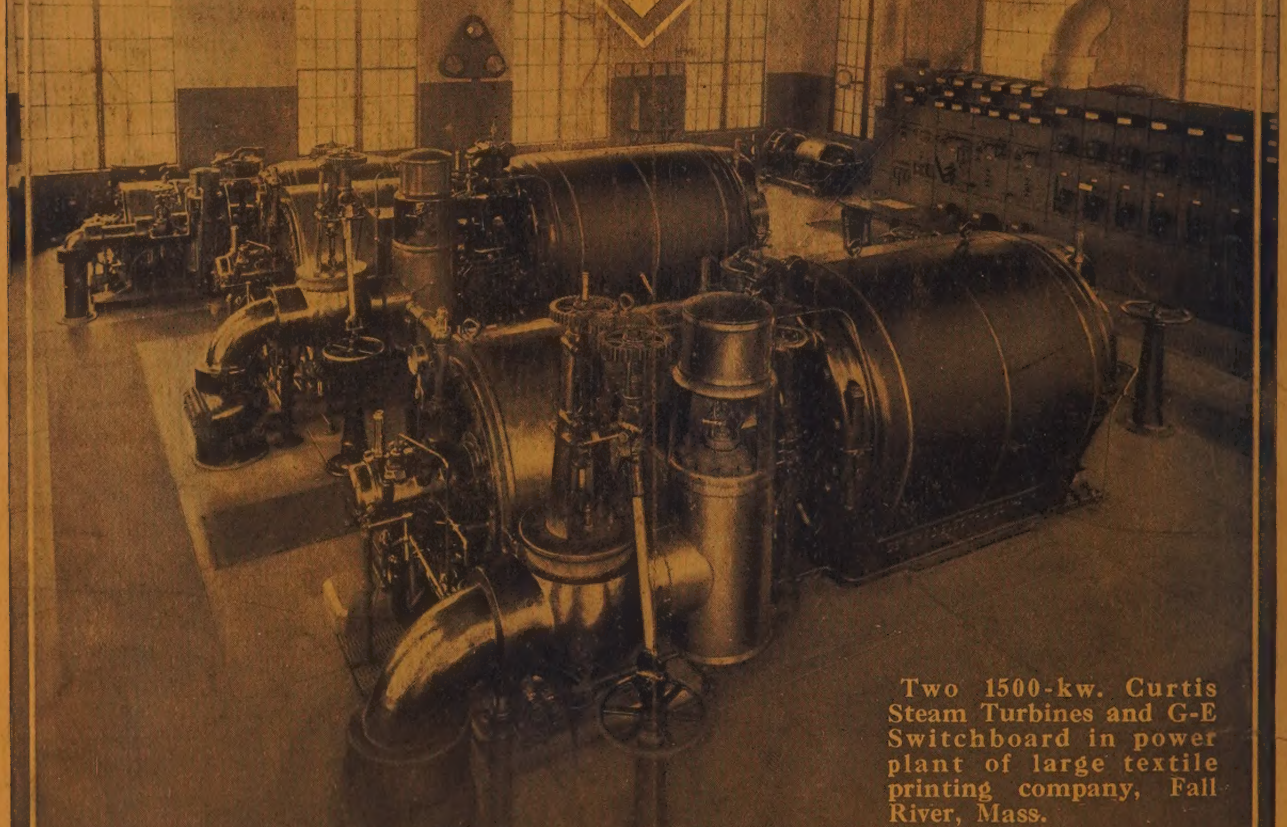
Brill Magazine has completed its tenth year in the electric railway field. It will continue along its customary, well-defined path of non-interference with the trade journals of the field.

THE J. G. BRILL COMPANY, PHILADELPHIA, PA.
AMERICAN CAR COMPANY, ST. LOUIS, MO.
G. C. KUHLMAN CAR COMPANY, CLEVELAND, OHIO
WASON MFG. COMPANY SPRINGFIELD, MASS.

General Electric Company

Manufacturers of Steam Turbines Ranging in Capacity from 1 to 50,000 Kw.

CURTIS TURBINES — CLOSELY LINKED — RELIABILITY — ECONOMY



Two 1500-kw. Curtis Steam Turbines and G-E Switchboard in power plant of large textile printing company, Fall River, Mass.

General Electric Company

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chattanooga, Tenn.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Columbus, Ohio
Dayton, Ohio
Denver, Colo.
Des Moines, Iowa
Duluth, Minn.
Elmira, N. Y.
Erie, Pa.
Fort Wayne, Ind.
Hartford, Conn.
Indianapolis, Ind.

General Office: Schenectady, N.Y.

ADDRESS NEAREST OFFICE

Jacksonville, Fla.
Joplin, Mo.
Kansas City, Mo.
Knoxville, Tenn.
Los Angeles, Cal.
Louisville, Ky.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
Nashville, Tenn.
New Haven, Conn.
New Orleans, La.
New York, N. Y.
Niagara Falls, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Pittsburg, Pa.
Portland, Ore.
Providence, R. I.
Richmond, Va.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah
San Francisco, Cal.
Schenectady, N. Y.
Seattle, Wash.
Spokane, Wash.
Springfield, Mass.
Syracuse, N. Y.
Toledo, Ohio
Washington, D. C.
Youngstown, Ohio

For Michigan Business refer to General Electric Company of Michigan, Detroit.
For Texas, Oklahoma and Arizona business refer to Southwest General Electric Company (formerly Hobson Electric Co.), Dallas, El Paso, Houston and Oklahoma City. For Canadian business refer to Canadian General Electric Company, Ltd., Toronto, Ont.

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